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February 5, 1997

Andrew Shively, Environmental Technician
Sites Management Section
VT DEC - Waste Management Division
103 South Main Street / West Office
Waterbury, VT 05671-0404

Re: Site Investigation Reports
Chuck's Convenience Store, Grove Street, Rutland, SMS Site #96-2037
Middlebury Beef & Grocery, East Middlebury, SMS Site # 96-2028

Dear Mr. Shively:

On behalf of S.B. Collins, we are submitting the enclosed site investigation reports for the above-referenced sites. If you would like to discuss our findings or recommendations, please feel free to call us at 229 - 1113 or Carl Ruprecht of S.B. Collins at 527 - 0116.

Sincerely,
HOFFER & ASSOCIATES



Jefferson P. Hoffer, P.G.
Principal Hydrogeologist

enc.

cc: Carl Ruprecht, S.B. Collins, Inc.

GROUNDWATER & ENVIRONMENTAL SERVICES

SITE INVESTIGATION REPORT

MIDDLEBURY BEEF & GROCERY
EAST MIDDLEBURY, VERMONT

JANUARY 1997

SITE INVESTIGATION REPORT
MIDDLEBURY BEEF & GROCERY
EAST MIDDLEBURY, VERMONT
SMS SITE # 96-2028

January 1997

Prepared for:
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EXECUTIVE SUMMARY

A site investigation was conducted during October of 1996 at the Middlebury Beef & Grocery in East Middlebury, Vermont. The investigation was performed to evaluate the degree and extent of subsurface petroleum contamination which was discovered during the removal of three underground storage tanks (USTs) at the site in May of 1996. The site investigation included a review of background information, the installation of four monitoring wells, laboratory analysis of groundwater samples, and an indoor air quality survey of nearby buildings.

Groundwater is present at three to five feet below grade, and site soils include silty sand and gravel to a depth of 13 feet. Groundwater flows to the west under a gradient of 0.007 and an estimated flow rate of 30 to 300 feet/year. Groundwater sampling results define a plume of petroleum-related contamination migrating westward from the former UST locations. Two of the five wells exhibited contaminant concentrations that exceed Vermont Groundwater Enforcement Standards. One well exhibited low concentrations of dissolved BTEX and MTBE, at concentrations below regulatory standards. Contamination was not detected in the remaining two monitoring wells or in the on-site water supply spring. The downgradient extent of dissolved contamination has not been defined and likely extends beyond Route 7, which makes up the western property boundary of Middlebury Beef & Grocery.

Potential receptors at the site include indoor air, surface water/wetlands and domestic and municipal water supplies. There were no visual indications of impact to the wetlands surrounding the site. Photoionization detector screening of indoor air found no evidence of petroleum vapor infiltration into either the Middlebury Beef building or to the Steven's Antique Shop, located just to the south of the site. Two domestic wells (Stevens and Sessions) are located south of the site, and two public water supply wells (East Middlebury Fire District) are located east of the site. All four of these wells are completed in a confined aquifer, consisting of sand and gravel, which is overlain by an extensive clay deposit. Contamination detected in shallow groundwater at the Middlebury Beef & Grocery does not appear to threaten these water supplies based on the presence of the clay confining layer and the westward flow direction of shallow groundwater at the site.

Additional monitoring well installations and groundwater monitoring are recommended to define the downgradient extent of impact to groundwater.

1.0 INTRODUCTION AND BACKGROUND

1.1 Introduction

This report summarizes a site investigation performed at the Middlebury Beef and Grocery in East Middlebury, Vermont. This investigation was initiated at the request of the Sites Management Section (SMS) of the Vermont Waste Management Division after evidence of petroleum contamination was detected in site soils and groundwater during the closure of three USTs in May of 1996. The USTs were utilized to store gasoline for retail sales, and were owned by S. B. Collins, Inc. (SBC) of St. Albans, Vermont.

Site investigation activities included a review of background information, the installation and sampling of groundwater monitoring wells, and an indoor air quality survey of Middlebury Beef and adjacent properties. This investigation was conducted in accordance with the proposed scope of work submitted to the SMS by Hoffer & Associates (H&A), dated September 25, 1996, a copy of which is included in Appendix A.

1.2 Background Information

Middlebury Beef and Grocery is a gas station and store located on U.S. Route 7 in East Middlebury. The property is owned and operated by Mr. Fred Hansen of Middlebury. The property has been used as a filling station and store since the early 1970's, prior to which the building was used as a butcher shop. No other uses of the property were reported.

On May 30, 1996, the three USTs owned by SBC were excavated and removed from the ground. The tanks included two 4,000-gallon tanks and one 6,000-gallon tank. Holes were observed in two of the three removed tanks, and petroleum sheens were visible on shallow groundwater entering the tank excavation. Soil samples collected from the tank excavation exhibited elevated photoionization detector (PID) readings indicative of petroleum contamination. Additional details regarding the UST closure are summarized in the site assessment report, which is included in Appendix A.

Two replacement USTs were installed at the site, and are owned by Mr. Hansen.

2.0 SITE DESCRIPTION

2.1 Site Location

Middlebury Beef and Grocery is located in East Middlebury on U. S. Route 7 between Vermont Routes 125 and 116 (see Figures 1 and 2). The properties next to the site consist of undeveloped fields and wetlands to the west and north, Stevens Antique Shop to the south, and more wetlands to the southeast. Land to the east is undeveloped property owned by the East Middlebury Fire District.

2.2 Environmental Setting

East Middlebury is located in the Champlain Valley physiographic province. The Champlain Valley is characterized by relatively flatter topography and lower elevation than the Green Mountain province, which forms the Champlain Valley's eastern border. The Champlain Valley overburden sediments consist largely of glacio-lacustrine and marine sands, silts and clays, which are underlain by carbonate and some siliceous bedrock units. The topography in the vicinity of the site is relatively flat, although there is a small hill located on the west side of Route 7, approximately 1,000 feet north of the site. Relief in the immediate vicinity is limited to manmade landscaping and drainage swales. Elevation at the site is about 420 feet above mean sea level.

East Middlebury is located within the Otter Creek drainage basin. Otter Creek is located approximately two miles west of the site. As mentioned above, there are wetland areas to the north, west, and southeast of the site, and there is a drainage ditch/intermittent stream running between the site and the property to the south (Stevens Antique Shop). The nearest named surface water feature is Beaver Brook, located 1,200 feet northwest of the site. Beaver Brook flows southwestward, ultimately joining the Middlebury River, which is located about 2,000 feet south of the site and flows westward. The Middlebury River drains into Otter Creek about two miles southwest of the site. Surface runoff at the site is either directed into storm drains along Route 7, or is allowed to run into the wetland areas which surround the site.

The surficial geology in the vicinity of the site is mapped by Stewart (1972) as either lacustrine sands and gravels or recent stream alluvium. Bedrock at the site is mapped by Stewart (1972) as the Gorge Formation, consisting of the Clarendon Springs, Ticonderoga and Rock River Dolomites, and by Doll (1961) as the Winooski Dolomite. All of these units are siliceous dolomites of Cambrian age.

2.3 Potential Receptors

Water Supplies

A review of the Vermont Water Supply Division's well database indicates there are two domestic supply wells located within a 1,000-foot radius of the site. The Stevens well (drilled originally for the Gateway Restaurant) is located about 250 feet south of the site, and the Sessions well is located about 600 feet southwest of the site. In addition, the East Middlebury Fire District operates two public water supply wells which are located about 500 feet east of the site. The wellhead protection area (WHPA) for the fire district's wells includes the Middlebury Beef & Grocery property. Locations of these wells are included on Figures 1 and 2, and well logs are provided in Appendix D. All four of these supply wells are completed within a confined sand and gravel aquifer, which is overlain by a thick deposit of lacustrine and marine clay.

Although municipal water is provided in the vicinity by the East Middlebury Fire District, the Middlebury Beef & Grocery utilizes a shallow spring, which is located about 200 feet east of the building.

Indoor Air Quality

Aside from the Middlebury Beef & Grocery store, and the only other building within 500 feet of the site is Stevens Antique Shop, which is located on the adjacent property south of the site.

Surface Waters

The nearest stream is Beaver Brook, which is located 1,200 feet to the northwest, and numerous wetlands are present around the site.

Other Receptors

No other sensitive environmental receptors or potential receptors were identified during the site investigation.

3.0 SITE CHARACTERIZATION ACTIVITIES

3.1 Soil Boring/Monitoring Well Installations

Four groundwater monitoring wells were installed at the site on October 21, 1996. Well locations are shown on Figure 3. One well (MW-1) was present at the site prior to the site investigation, and this well had been installed by SBC several years before as a leak-detection monitoring well. The four new wells were installed by Tri-State Drilling and Boring under the supervision of Hoffer & Associates. The borings were advanced using 4.25-inch hollow-stem augers. Split-spoon soil samples were collected every five feet. The split-spoon samples and soil cuttings returned on the augers were characterized for color, moisture, USDA texture, and were screened for volatile organic compounds using a PID. After drilling to approximately five feet below the water table, two-inch diameter PVC monitoring wells were installed. Logs of the borings and well construction details are provided in Appendix B.

Soils observed during well installation efforts included a layer of gravelly sand fill extending to depths between two and five feet below grade, underlain by gravelly sand, with occasional lenses of silty sand. Sand grain sizes ranged from fine to coarse, and the shape of the gravel ranged from angular to sub-rounded. The gravelly sand extended to the maximum depth of the monitoring wells, which ranged from 11.5 and 13.0 feet below ground surface. Groundwater was observed at depths ranging from three to four feet below grade.

PID screening of soil samples was conducted using a Photovac Model 2020 equipped with 10.6 eV lamp and calibrated to isobutylene. Headspace measurements were collected by placing representative soil samples in plastic zip-lock bags and inserting the PID probe into the bag. Elevated PID readings indicative of petroleum contamination were found in soil samples from MW-102 (1027 ppm at a depth of five feet) and MW-103 (27.7 ppm from a depth of five feet). PID screening results are included on the logs in Appendix B.

3.2 Groundwater Elevations and Flow Direction

Site groundwater levels were measured on October 21 and 31, 1996. Table 1 presents water level depths and converted groundwater elevations. A water-table map for the October 31 data is provided on Figure 4, and depicts a westward flow direction under a gradient of 0.007.

3.3 Groundwater Quality

Groundwater sampling was conducted on October 31, 1996, in accordance with the procedures outlined in the scope of work. Before samples were collected, water levels and headspace PID measurements were obtained from all five wells. A minimum of

three well volumes were purged from each well before sampling, except in MW-1, which began to go dry before three volumes could be removed. In addition, a sample was collected from the spring used by the Middlebury Beef & Grocery store. This sample was collected from the sink in the store bathroom after allowing the tap to run for approximately five minutes.

The samples were analyzed by EPA Method 8020 for benzene, toluene, ethylbenzene, and xylenes (BTEX) and methyl-tert-butyl ether (MTBE) by Scitest Laboratory Services. Quality assurance/quality control (QA/QC) samples included a trip blank, a field blank, and a blind duplicate sample, which was collected from MW-103 and labeled MW-D. Laboratory results and the chain-of-custody are provided in Appendix C.

Groundwater sampling results compiled on Table 2. BTEX and MTBE were detected in MW-1, MW-102, and MW-103. The Vermont Groundwater Enforcement Standards for all the BTEX compounds and the Vermont Health Advisory limit for MTBE were exceeded in MW-1 and MW-102. Relatively low concentrations of toluene, ethylbenzene, xylenes, and MTBE were detected in MW-103, at concentrations below regulatory thresholds. Contaminants were not detected in the remaining two monitoring wells nor in the sample collected from the spring that supplies the store.

The distribution of contamination at the site is illustrated on Figure 5, which is an isoconcentration contour map for MTBE in shallow groundwater. The sampling results depict a plume of dissolved-phase contamination migrating westward from the former USTs toward to and under Route 7.

3.4 Indoor Air Quality

An indoor air quality was conducted with a PID on October 31 in the store and in Stevens Antique Shop to determine whether gasoline vapors originating at the site have infiltrated these buildings. The survey was conducted with a PID in the basements and openings (plumbing, other utility openings, drains, cracks, etc.) in the building foundations. There were no PID readings above background in any of the indoor areas surveyed.

4.0 DISCUSSION OF RESULTS

4.1 Hydrogeology

Shallow soil exposed during the UST removals included silty sands and gravelly sand. Soil samples collected during well installation efforts included gravelly sand with some lenses of silty sand. Grain size of the sand ranged from fine to coarse, and the shape of the gravel ranged from angular to sub-rounded. These indications of only moderate sorting are consistent with the surficial geologic maps of the region, which depict lacustrine sand and gravel, and/or recent stream alluvium.

Well logs for the water supply wells near the site indicate that this surficial layer is about 10 to 15 feet thick, and is underlain by an extensive deposit of lacustrine and/or marine clay. The lacustrine/marine deposits are 70 to 90 feet thick near the site, and are underlain by water-bearing sand and gravel, which is the aquifer tapped by the nearby supply wells. All of the four nearby wells are overflowing, indicating that the sand and gravel aquifer is under considerable confining pressure.

Thus the shallow groundwater zone impacted by petroleum releases at the site occurs within a relatively thin (10 to 15 feet thick) zone of fluvial sediments underlain by low permeability lacustrine/marine sediments. Groundwater elevations depict a westward flow direction, toward the drainage ditch and wetlands on the western side of Route 7. The discharge area for shallow groundwater originating at the site may be the wet areas west of the site, or ultimately Beaver Brook, which is located 1,200 feet downgradient from the site.

We estimate the hydraulic conductivity (K) of the shallow groundwater zone at this site is in the range of 2.8 to 28 feet/day (1×10^{-3} to 1×10^{-2} cm/sec). This estimate is based on published literature values for similar soil types (Freeze & Cherry, 1979, and Fetter, 1988), and our experience at similar sites where slug tests have been performed. The hydraulic gradient (I) at the site is a uniform 0.007 ft/ft. Using these values and an effective porosity (n_e) estimate of 0.25, the average linear velocity (V_x) can be estimated from the equation $V_x = KI/n_e$, which indicates a range from 30 to 300 feet/year.

4.2 Source, Degree, and Extent of Contamination

Holes were observed in two of the former gasoline tanks which were removed in May of 1996, suggesting that the source of contamination was leakage from these tanks. Contamination in shallow groundwater is highest in the area just downgradient from the former UST locations.

Petroleum sheens were observed on shallow groundwater during the tank removals. Sheens were also observed on water purged from MW-1 and MW-102 during sampling activities, although no accumulations of free product were observed. The presence of sheens suggests that soil-adsorbed contamination is present in soil near the

former USTs, and will remain a source for continued dissolved-phase contamination. Groundwater analyses define a plume of gasoline-related constituents downgradient from the former UST area. The downgradient extent of contamination has not been defined, and likely extends westward under Route 7.

4.3 Potential Receptors

PID screening of the site building and adjoining property found no evidence of petroleum vapor migration. No visual evidence of contamination was observed in the drainage ditch or wetland areas downgradient of the site (on the other side of Route 7).

Four water supply wells, including two public water supply wells, are located near the site. All of these wells are either sidegradient or upgradient from the site. More importantly, these wells are completed within a deep sand and gravel aquifer, which is confined by a thick clay layer. As a result, site contamination does not pose a risk to these water supplies.

4.4 Conclusions and Recommendations

A site investigation was conducted at the Middlebury Beef & Grocery in East Middlebury, Vermont, to evaluate the degree and extent of subsurface petroleum contamination that was discovered during UST closures in May of 1996. Monitoring well installation and groundwater sampling efforts define a plume of dissolved-phase contamination migrating to the west from the former UST locations. BTEX and MTBE were detected in three of the monitoring wells, and concentrations exceeding Vermont Groundwater Enforcement Standards were found in two of the wells. The downgradient extent of the plume was not defined. Groundwater is present at three to five feet below grade, and site soils include silty sand and gravel to a depth of 13 feet.

Potential receptors at the site include indoor air, surface water/wetlands and domestic and municipal water supplies. There were no visual indications of impact to the wetlands surrounding the site. Photoionization detector screening of indoor air found no evidence of petroleum vapor infiltration into either the Middlebury Beef building or Steven's Antique Shop, located just to the south of the site. Two domestic wells (Stevens and Sessions) are located south of the site, and two public water supply wells (East Middlebury Fire District) are located east of the site. All four of these wells are completed in a confined aquifer, consisting of sand and gravel, which is overlain by an extensive clay deposit. None of these wells appear to be threatened by the petroleum contamination in shallow groundwater at Middlebury Beef & Grocery based on the presence of the clay confining layer and the westward flow direction of shallow groundwater at the site.

Additional monitoring well installations and groundwater monitoring are recommended to define the downgradient extent of shallow groundwater contamination. Proposed monitoring well locations are shown on Figure 6. The estimated costs to install additional monitoring wells, perform a round of groundwater monitoring, and prepare a status report, are presented on Table 3.

REFERENCES

- Doll, C G., Cady, W. M., Thompson, J. B., Jr., and Billings, M. P., 1961, Centennial Geologic Map of Vermont, Vermont Geological Survey.
- Freeze, R. Allan and John A. Cherry, 1979, Groundwater, Prentice Hall, Inc., Englewood Cliffs, NJ, 604 pp.
- Fetter, C. W., 1988, Applied Hydrogeology, Second Edition, Merrill Publishing Company, Columbus, OH, 592 pp..
- Stewart, David P., 1972, Geology for Environmental Planning in the Rutland-Brandon Region, Vermont, Environmental Geology No. 1, Vermont Geological Survey.
- Stewart, David P., and P. MacClintock, 1970, Surficial Geologic Map of Vermont, Vermont Geological Survey.

TABLE 1
Groundwater elevation measurements,
Middlebury Beef & Grocery, East Middlebury, Vermont,
SMS Site # 96-2028.

DEPTH TO WATER MEASUREMENTS
(feet below TOC)

WELL ID	Elev. of TOC (feet)	10/21/96	10/31/96
MW-1	97.76	5.12	5.54
MW-101	97.72	3.24	3.56
MW-102	97.95	4.32	4.91
MW-103	96.92	3.39	3.92
MW-104	97.39	3.64	4.15

GROUNDWATER ELEVATIONS (feet)

WELL ID	Elev. of TOC (feet)	10/21/96	10/31/96
MW-1	97.76	92.64	92.22
MW-101	97.72	94.48	94.16
MW-102	97.95	93.63	93.04
MW-103	96.92	93.53	93.00
MW-104	97.39	93.75	93.24

Notes:

TOC = top of casing (pvc)
Elevations are relative to an on-site benchmark of 100.00 feet

TABLE 2
Groundwater sampling results for October 31, 1996,
Middlebury Beef & Grocery, East Middlebury, Vermont,
SMS Site # 96-2028.

Results in ug/L

WELL ID	Benzene	Toluene	Ethylbenzene	Xylenes	MTBE
MW-1	13700	23700	2080	17400	18800
MW-101	<1	<1	<1	<1	<1
MW-102	1540	9320	1400	9200	494
MW-103	< 5 / < 20	27 / 34	41 / 34	9 / < 20	9 / < 20
MW-104	<1	<1	<1	<1	<1
Spring-1	<1	<1	<1	<1	<1
Trip Blank	<1	<1	<1	<1	<1
Field Blank	<1	<1	<1	<1	<1

Notes:

<1 = below a detection level of 1
<1 / <1 = sample result / field duplicate result

REGULATORY THRESHOLDS

(ug/L)

Standard	Benzene	Toluene	Ethylbenzene	Xylenes	MBTE
VT GES	5	2420	680	400	-
VT PAL	0.5	1210	340	200	-
VHA	1	-	-	-	40
MCL	5	1000	700	10000	-

Notes:

VT GES = Vermont Groundwater Enforcement Standard
VT PAL = Vermont Preventative Action Limit
VHA = Vermont Health Advisory
MCL = Maximum Contaminant Level

TABLE 3

Cost estimate for additional site investigation,
Middlebury Beef and Grocery, East Middlebury, Vermont, SMS Site #96-2028.

LABOR

TASK	Staff	Hours	Rate	Amount
Monitoring Well Drilling	TFS	10.00	\$35.00	\$350.00
Site Survey/Basemap Update	TFS	2.00	\$35.00	\$70.00
Prepare Well Logs	TFS	2.00	\$35.00	\$70.00
Groundwater Sampling	TFS	6.00	\$35.00	\$210.00
Map Preparation - Water Table, Isoconcentration	JPH	2.00	\$45.00	\$90.00
Report Preparation	TFS	20.00	\$35.00	\$700.00
Report Preparation	JPH	2.00	\$45.00	\$90.00

SUB-TOTAL LABOR **\$1,580.00**

EXPENSES

ITEM	Quantity	Rate	Mark Up	Amount
Mileage - Drilling	110	0.28	\$0.00	\$30.80
Mileage - GW Sampling	110	0.28	\$0.00	\$30.80
PID Rental - Drilling	1	\$75.00	\$0.00	\$75.00
<u>Adams Engineering</u>				
Monitoring Well Drilling - 3 Wells, Surveying	3	\$285.00	\$0.00	\$855.00
Monitoring Well Drilling - Mobilization	1	\$130.00	\$0.00	\$130.00
<u>Scitest Laboratory Services</u>				
8020 Analyses for BTEN/MTBE (7 wells, 1 spring, 3 QA/QC)	11	\$40.00	\$0.00	\$440.00

SUB-TOTAL EXPENSES **\$1,561.60**

TOTAL ESTIMATED PROJECT COST **\$3,141.60**

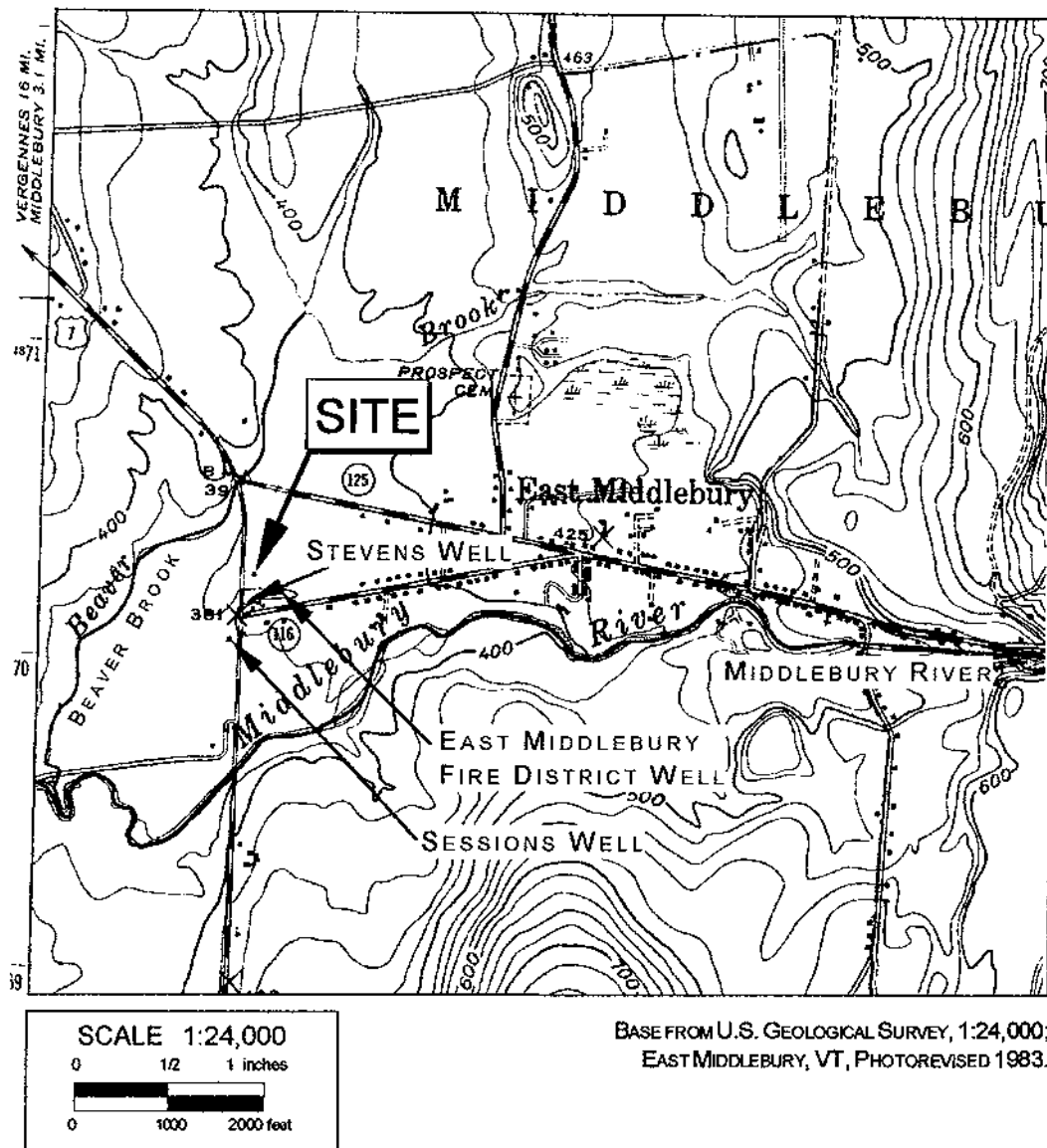
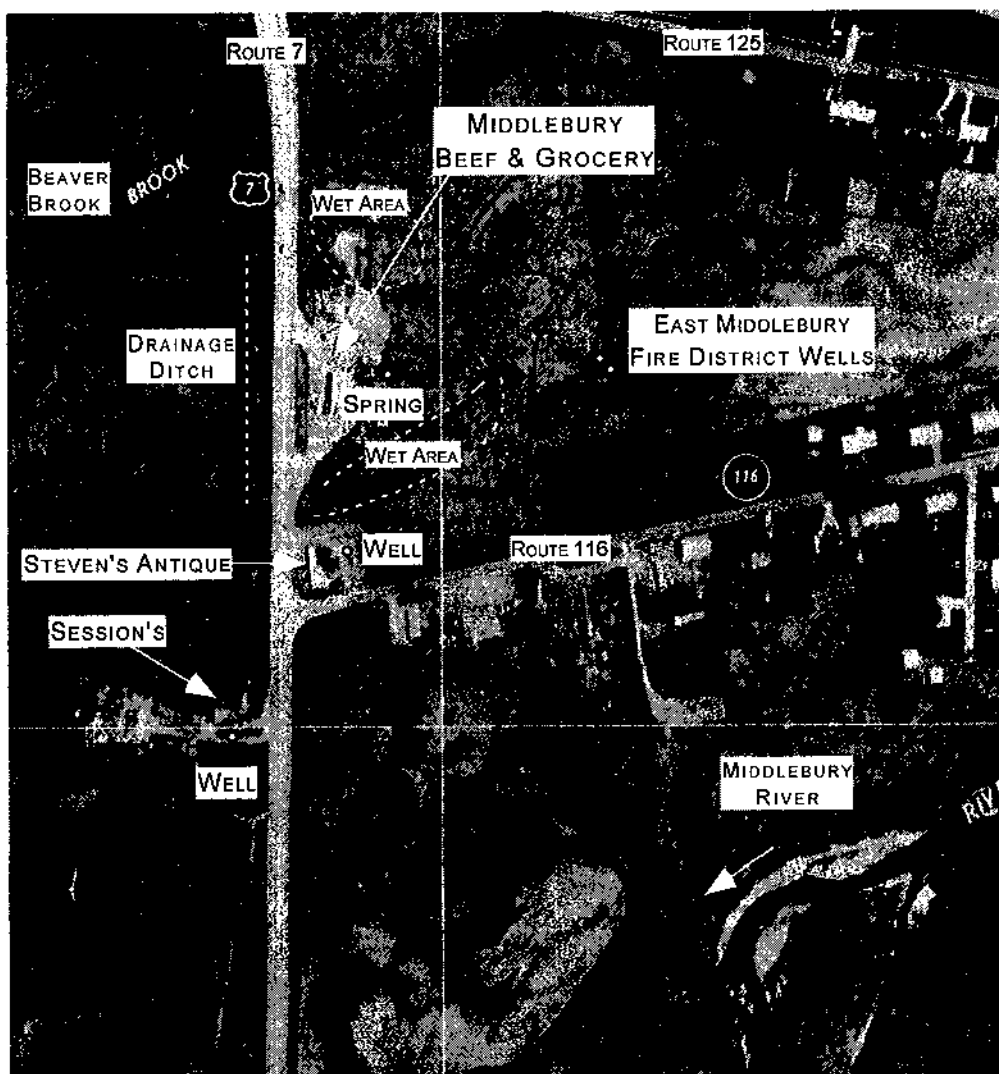


FIGURE 1
USGS TOPOGRAPHIC MAP SHOWING LOCATION OF
MIDDLEBURY BEEF & GROCERY,
EAST MIDDLEBURY, VERMONT, SMS SITE #96-2028.



MAP SCALE 1:5000
1 INCH = 416.7 FEET

BASEMAP IMAGE SCANNED FROM
VERMONT MAPPING PROGRAM ORTHOPHOTO
FARMINGDALE, SHEET #100160, SERIES 5000, 1978

FIGURE 2
SITE VICINITY MAP, MIDDLEBURY BEEF & GROCERY,
EAST MIDDLEBURY, VERMONT, SMS SITE #96-2028.

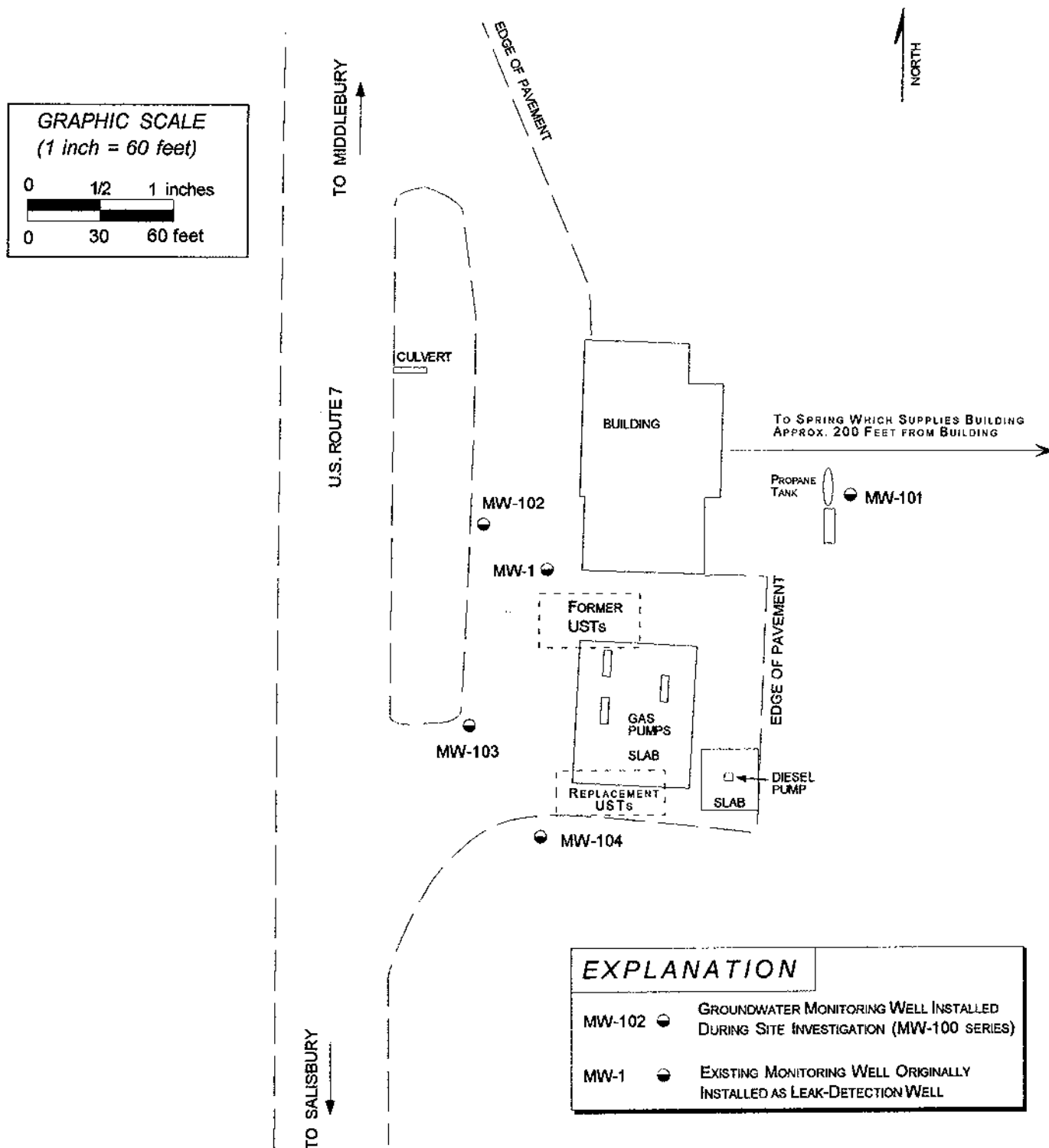


FIGURE 3
SITE MAP, MIDDLEBURY BEEF & GROCERY,
EAST MIDDLEBURY, VERMONT, SMS SITE #96-2028.

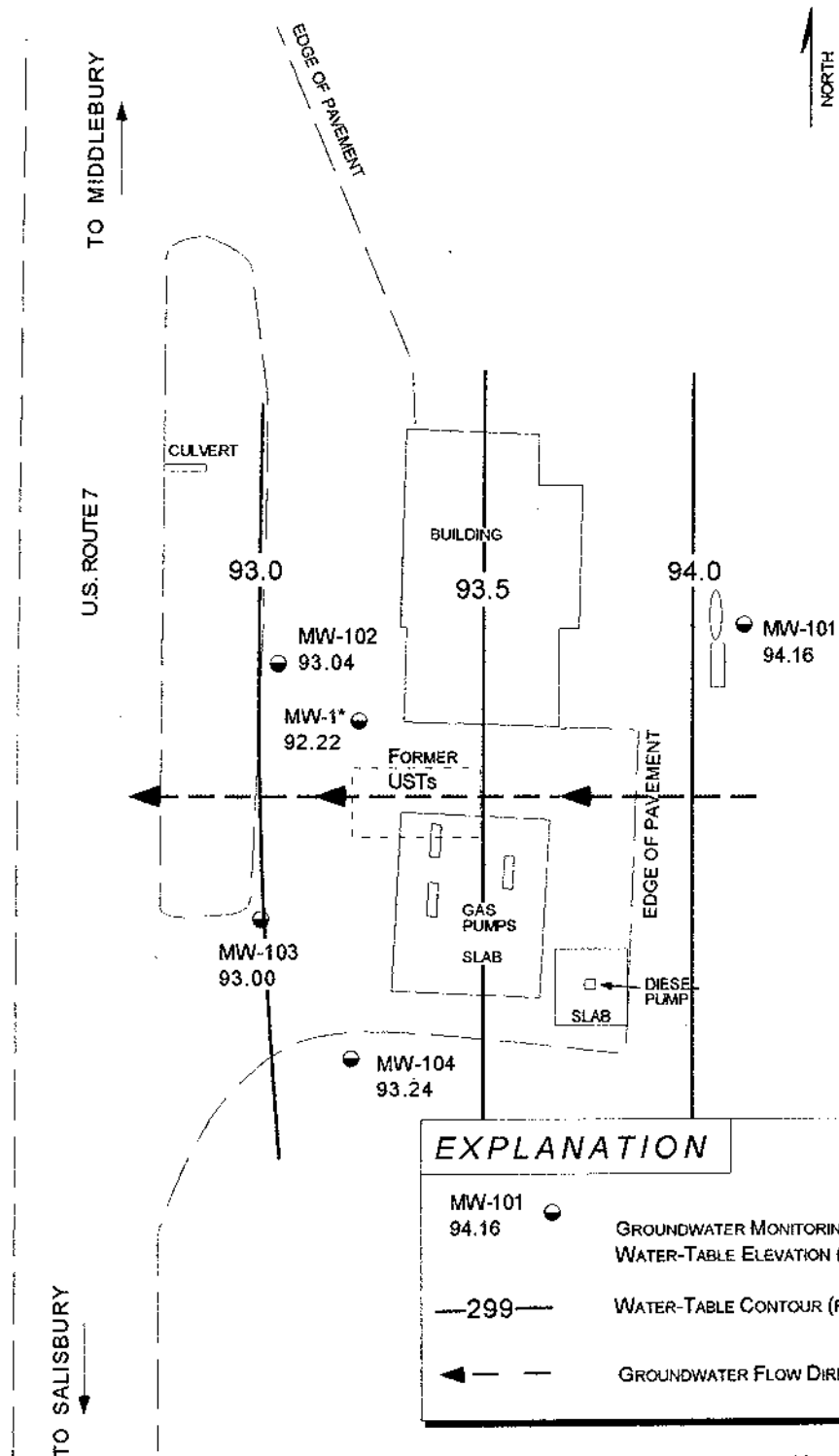
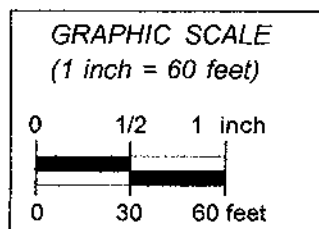


FIGURE 4
WATER-TABLE MAP FOR OCTOBER 31, 1996,
EAST MIDDLEBURY, VERMONT, SMS SITE #96-2028.

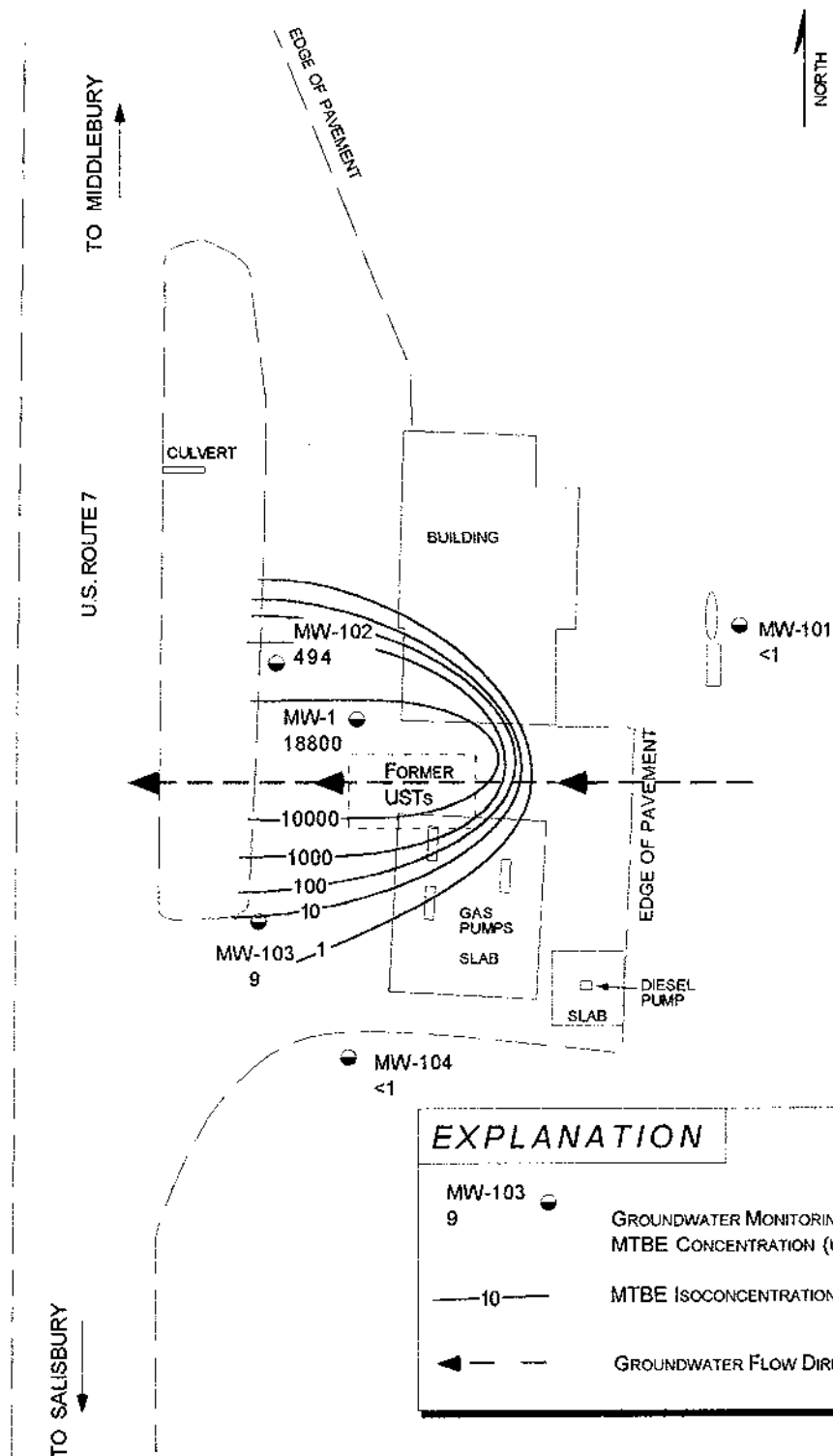
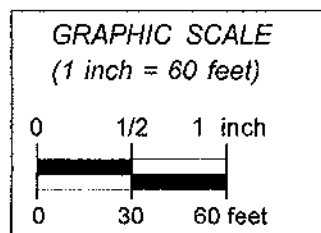


FIGURE 5
MTBE ISOCONCENTRATION CONTOUR MAP
FOR OCTOBER 31, 1996, MIDDLEBURY BEEF & GROCERY,
EAST MIDDLEBURY, VERMONT, SMS SITE #96-2028.

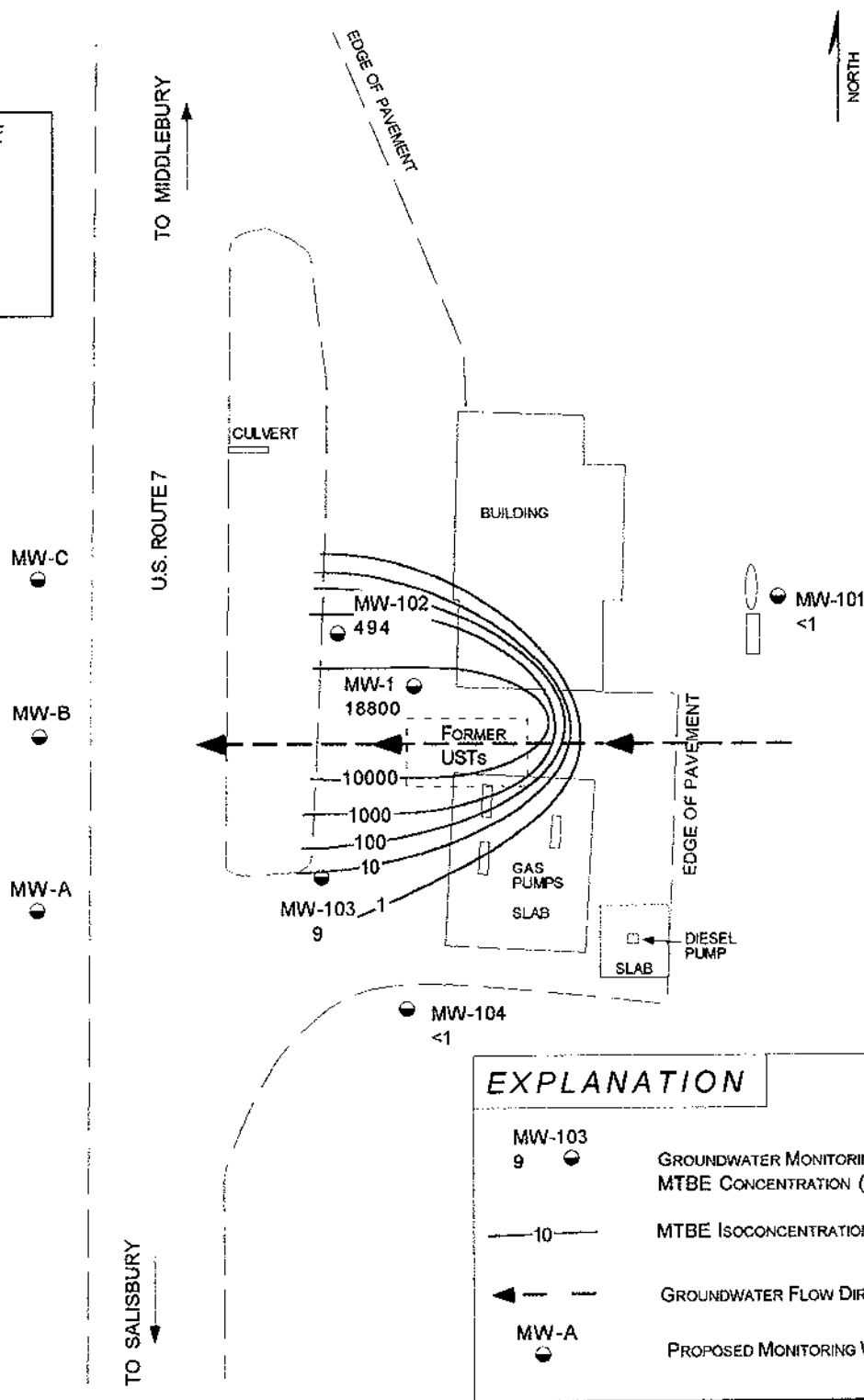
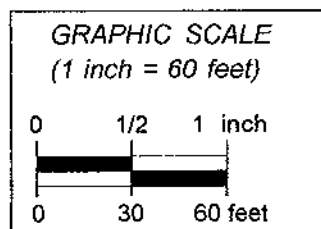


FIGURE 6
PROPOSED ADDITIONAL MONITORING WELLS,
MIDDLEBURY BEEF & GROCERY,
EAST MIDDLEBURY, VERMONT, SMS SITE #96-2028.

Appendix A
Relevant Correspondence



HOFFER & ASSOCIATES

CONSULTING HYDROGEOLOGISTS

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September 25, 1996

Carl Ruprecht
S.B. Collins, Inc.
54 Lower Welden Street
St. Albans, VT 05478

Re: Workplan/Cost Estimate for Site Investigation;
Middlebury Beef & Grocery, Middlebury, Vermont
SMS Site #96-2028

Dear Carl:

In response to the Sites Management Section's (SMS) letter dated September 19, 1996, we have prepared the following work plan and enclosed cost estimate for a site investigation at the Middlebury Beef & Grocery. The site investigation will attempt to further define the degree and extent of petroleum contamination and evaluate the potential for sensitive receptors to be impacted by the contamination. We propose to install four shallow groundwater monitoring wells at the site to map groundwater flow directions and assess the impact of petroleum releases at the site on groundwater quality. As part of the site investigation, we will collect information on the site environmental setting and potential receptors. An indoor air quality survey will be performed using a photoionization detector (PID) to determine if petroleum vapors are impacting nearby structures. The data collected during the site investigation efforts will be summarized and evaluated in a summary report.

SCOPE OF WORK

General Site Characterization

General information pertaining to the environmental setting of the site will be assembled from various sources including USGS topographic maps, SCS soil maps, geologic and hydrologic reports, and the Water Supply Division's water well inventory database. This information will be presented in the site investigation report. Location, vicinity, and site maps will be prepared and included in the report.

GROUNDWATER & ENVIRONMENTAL SERVICES

Indoor Air Quality Screening

To ascertain if site contamination poses a risk to indoor air quality, a PID survey will be performed in the Middlebury Beef & Grocery building and adjacent buildings which could be impacted by contamination originating at the site.

Monitoring Well Installations

To determine the degree and extent of groundwater contamination, we propose to install four groundwater monitoring wells. We propose to contract Adams Engineering to install the monitoring wells using their "mini-rig" drilling procedures. The boreholes will be advanced to at least five feet below the top of the water table, which is estimated to be about eight feet below grade based on observations during the UST closures. The wells will be constructed with 1.5-inch or 2-inch diameter PVC. A ten-foot section of factory slotted well screen (0.010-inch) will be used for each well. The screened sections will be positioned to intercept the water table to allow for seasonal water table fluctuation, and to monitor for floating free product. A sandpack will be placed around the outside of the screen. A bentonite seal will be used near the surface of the borehole to minimize surface infiltration around the outside of the well. The wells will be developed by bailing or by pumping with a peristaltic pump.

Soil samples will be characterized for color, moisture, texture (SCS), and other properties. Representative samples will be screened with a PID to evaluate relative levels of contamination. The soil samples will be placed into plastic zip-lock bags and the PID probe will be inserted into the bag to measure organic vapor concentrations.

The placement of the four wells will depend upon site access and utility clearance issues. The store has a spring located about 250 east of the former USTs. At least one monitoring well will be located between this spring and the former USTs.

After installing the four monitoring wells, a site survey will be performed to allow preparation of a site basemap. The survey will include obtaining elevations of the four monitoring wells as well as the spring mentioned above.

Groundwater Sampling and Analysis

Each of the four wells and the spring will be sampled for BTEX and MTBE. Prior to sample collection, PID well headspace and water level measurements will be recorded for each well. An interface probe will be utilized to monitor for floating free product in wells where free product is suspected. Prior to sample collection, the wells will be purged of three well volumes (or until dry). Purging and sampling activities will be conducted using dedicated polyethylene bailers.

Quality assurance/quality control samples will include a trip blank, a field blank, and a blind duplicate. The trip blank will be provided by the laboratory. It will be transported with all sample vials to the site, handled in a similar fashion as collected samples, and then accompany the samples back to the laboratory. The field blank will be filled on site by pouring deionized water into sample vials at the conclusion of sampling activities. A blind duplicate will be collected from one of the wells along with the sample from that well, and will be labeled with a fictitious sample name and time. A laboratory chain-of-custody form and field sampling data sheet will be utilized to document the sampling event. The chain-of-custody form will accompany the samples to the laboratory.

All samples will be analyzed for BTEX and MTBE using EPA Method 8020. We propose to utilize Scitest Laboratory Services of Randolph, Vermont.

Groundwater Elevations

Site groundwater levels will be measured upon well completion and during the sampling event. Water levels will be converted to elevations in order to construct water-table maps.

Report Preparation

Following the field efforts, a summary report will be prepared which details the field procedures and sampling results at the site. The report will include descriptions of investigative procedures covering monitoring well installations, groundwater sampling, soil screening, and PID surveys. The report will include well logs, tabulations of water levels and analytical data, water-table maps, and isoconcentration contour maps. The report will present an interpretation of the site hydrogeology and extent of contamination, and a qualitative assessment of risks posed by site contamination to potential receptors.

Project Costs

The estimated project costs are as follows:

Hoffer & Associates	\$2,222.40
Well Driller	\$1,265.00
Laboratory	\$320.00

ESTIMATED TOTAL \$3,807.40

Carl Ruprecht
September 25, 1996
Page 4

The anticipated time frame for completion of the field work phase of this project through submittal of the site investigation report is approximately six to eight weeks. If you have any questions or comments concerning this scope of work or cost estimate, please give us a call.

Sincerely,
HOFFER & ASSOCIATES

A handwritten signature in dark ink, appearing to read "Jeff P. Hoffer", written in a cursive style.

Jefferson P. Hoffer, P.G.
Principal Hydrogeologist

enc.

TABLE 1
Cost estimate for site investigation,
Middlebury Beef and Grocery, Middlebury, Vermont, SMS Site #96-2028.

LABOR

TASK	Staff	Hours	Rate	Amount
Health & Safety Plan	TFS	1.00	\$35.00	\$35.00
Background Information Review	TFS	6.00	\$35.00	\$210.00
Site Visit for Well Siting/Utility Clearance	TFS	4.00	\$35.00	\$140.00
Monitoring Well Drilling	TFS	12.00	\$35.00	\$420.00
Site Survey/Basemap Update	TFS	2.00	\$35.00	\$70.00
Prepare Well Logs	TFS	2.00	\$35.00	\$70.00
Map Preparation - Site/Location/Water Table/Isoconcentration	JPH	4.00	\$45.00	\$180.00
Report Preparation	TFS	24.00	\$35.00	\$840.00
Report Preparation	JPH	2.00	\$45.00	\$90.00

SUB-TOTAL LABOR **\$2,055.00**

EXPENSES

ITEM	Quantity	Rate	Mark Up	Amount
Mileage - Utility Clearance	110	\$0.28	\$0.00	\$30.80
Mileage - Monitoring Well Drilling	110	\$0.28	\$0.00	\$30.80
Mileage - Groundwater Sampling	110	\$0.28	\$0.00	\$30.80
PID Rental - Survey & monitoring well drilling	1	\$75.00	\$0.00	\$75.00
<u>Adams Engineering</u>				
Monitoring Well Drilling - Mobilization	1	\$125.00	\$0.00	\$125.00
Monitoring Well Drilling - 4 wells, Surveying	4	\$285.00	\$0.00	\$1,140.00
<u>SCITEST LABORATORY SERVICES</u>				
8020 analyses for BTEX/MTBE (4 wells, 1 spring, 3 QA/QC)	8	\$40.00	\$0.00	\$320.00

SUB-TOTAL EXPENSES **\$1,752.40**

TOTAL ESTIMATED PROJECT COST **\$3,807.40**



HOFFER & ASSOCIATES

CONSULTING HYDROGEOLOGISTS

RR 4, Box 2286
Montpelier, VT 05602
(802) 229 - 1113
fax: 229 - 2780

June 4, 1996

Carl Ruprecht, UST Manager
S.B. Collins, Inc.
54 Lower Welden Street
St. Albans, Vermont 05478

Re: UST Site Assessment, Middlebury Beef and Grocery, VT
UST Facility ID # 1373

Dear Carl:

This letter presents the results of the underground storage tank (UST) site assessment undertaken at Middlebury Beef and Grocery, in East Middlebury, Vermont. Three gasoline USTs (two 4,000-gallon and one 6,000-gallon) were permanently closed at the site on May 30, 1996. UST cleaning services were provided by Environmental Products and Services of Burlington, Vermont, and excavation services were provided by Perry's Excavating of Georgia, Vermont. The site is owned by Mr. Fred Hansen of Middlebury, Vermont. Assessment included inspection of the USTs after their removal and photoionization detector (PID) screening of excavation soils and water. Included with this letter are the Vermont UST Program tank closure forms for you to complete and submit to the State. Also included are photographs taken of the USTs and removal activities.

This assessment also included screening of soils excavated in order to make room for two new USTs installed to the south of the old USTs.

UST Removals and Observations

I arrived on site at approximately 8:30 AM, on May 30. The USTs had been uncovered and cleaned in-place on May 28 and 29, 1996. When I arrived the two 4,000-gallon USTs had been removed from the excavation and were lying next to the excavation. The third UST was still in the excavation, and the soils surrounding it were being removed. The pumps and the product and vent piping had been removed prior to my arrival.

Inspection of the two 4,000-gallon tanks revealed that there were holes in both. Three holes were observed in the first UST. The holes were located in the southern end of the tank, approximately 2.5 feet (halfway) from the base of the UST. The diameters of the holes ranged from 0.2 to 0.4 inches, and were associated with a ring of heavy corrosion and pitting that encircled the tank. There were also three holes in the second 4,000-

GROUNDWATER & ENVIRONMENTAL SERVICES

Carl Ruprecht

June 4, 1996

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gallon UST, one of which was located in the southern end of the tank. The other two were located in the sidewall of the UST, approximately three feet from the northern end of the tank. These holes were all approximately 0.2 inches in diameter. These holes were also associated with a ring of corrosion and pitting, at about the same level as on the first tank.

The 6,000-gallon UST was removed while I was on site. This UST was in better condition than the first two, with localized minor pitting and slight surface corrosion present overall, although no holes were observed.

Soils observed in the excavation consisted of two units. The uppermost, extending to a depth of approximately 4 feet, consisted of brown, slightly moist, gravelly silty sand, and was probably fill placed around the USTs and piping after their installation. Beneath this layer was a gray, moist to wet, gravelly silty sand. Groundwater, which was entering the excavation at a depth of about eight feet, was present in this lower unit.

Soil PID headspace measurements were taken from soils located in the excavation floor and sidewalls using a Photovac Model 2020 photoinization detector (PID) equipped with a 10.6 eV lamp. The PID was calibrated to isobutylene prior taking readings. PID readings were obtained by placing a soil sample into a zip lock bag and measuring the headspace above the sample. PID headspace readings from the excavation soils ranged from 40 to 1998 parts per million (ppm). Headspace measurements were obtained from five locations within the excavation. In addition, soils that had been piled next to the excavation prior to my arrival were screened with the PID. These soils had been removed from above and beside the USTs during removal. PID headspace readings from these soils ranged from 620 to over 2000 ppm. All of the soils removed (an estimated 15 yards) during the excavation of the USTs were backfilled into the excavation at the conclusion of closure activities.

Sheens were observed on the surface of water entering the excavation under the 6,000-gallon UST. A PID headspace measurement taken from a sample of this water gave a reading of 100 ppm.

There were reportedly four monitoring wells present at the site prior to the removal of the USTs. While I was on site, it appeared that at least two of the wells were destroyed during the UST removals. The remaining wells were either buried under soils or were also destroyed.

New UST Installation

While I was on-site, two new USTs were being installed by the owner of the property to replace the USTs being closed. I performed PID headspace screening of the soils being removed from this excavation in an effort to determine whether there was any impact to site soils away from the original USTs. None of the PID readings from these soils gave results above background. In addition, I performed headspace screening of water being

Carl Ruprecht

June 4, 1996

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pumped from the excavation. There were no PID readings above background in these samples either.

Soils in this excavation consisted largely of brown silty sands, with occasional gravelly sand layers. There was iron oxide staining and mottling present in the soils at a depth of four to five feet in this excavation, which is probably indicative of the seasonal high water table. Water was observed entering the excavation at a depth of approximately eight feet during my visit.

Potential Receptors

The site is bordered to the west, north, and east by wetlands. To the south is an antique store and Vermont Route 116. The nearest surface water, aside from the wetlands, is an unnamed tributary to the Middlebury River that forms the eastern border of the property. The Middlebury River is located about 2000 feet south of the site. Another tributary to the Middlebury River is located approximately 1000 feet to the west. The Middlebury River empties into Otter Creek, which passes two miles to the west.

Water is supplied to the building by a spring, located on the property about 250 feet east of the former UST locations. A second spring, reportedly about 20 yards east of the Middlebury Beef spring supplies water to the town of East Middlebury. Both of these springs are being sampled regularly as part of an investigation occurring at Dayton's Store, a filling station located about 2000 feet east of the site. Middlebury Beef uses a private septic system, located to the rear of the main building, and is reportedly heated using propane gas.

CONCLUSIONS AND RECOMMENDATIONS

Based on the elevated soil PID readings, the presence of sheens on water in the excavation, and the holes in the 4,000-gallon USTs, a site investigation is recommended. Site investigation activities should include the installation of additional monitoring wells to determine groundwater flow direction and the extent of contamination. Please do not hesitate to call if you have any questions regarding the results of the site assessment or these recommendations.

Sincerely,
HOFFER & ASSOCIATES

Timothy F. Schmalz
Project Geologist

enc.

PID Calibration information: Date 5/30/96 Time 0730 Type of Gas 100 ppm 1000 ppm
 Contamination detected with PID (ppm): Yes Peak 2000+ Depth of peak (ft) 8 Avg. 700 ppm, 1500 IN
 Soil samples collected for laboratory analysis? Yes # of samples No X SOIL
(show locations and depth of all readings and samples on diagram) PILE

Have soils been polyencapsulated on site? Yes list amount (cu. yds.): No X
 Have any soils been transported off site? Yes list amount (cu. yds.): No X
 Location transported to:
 Name of DEC official granting approval to transport soils: Date: / /
 Amount of soils backfilled, (cu. yds.): 15 (APPR.), Avg. PID 1500
 Have limits of contamination been defined? Yes No X
 Are you aware of any other contaminants which may be present? Yes No X
 Comments: THERE IS AN SMS SITE TO THE EAST - DAYTON'S STORE, LOCATED 3000' FROM
SITE.
 Free phase product encountered? Yes thickness No X - SHEENS ON GROUNDWATER IN
 Groundwater encountered? Yes X depth(ft) 8 No EXCAVATION

Were there existing monitoring wells on site? Yes X (# samples taken 0) No
 Have new monitoring wells been installed? Yes (# samples taken) No X
 Samples collected from monitoring wells for lab analysis? Yes No X
(include well location, test-depth readings, and laboratory results if applicable in a separate report and on the site diagram)
 Is there a water supply well or spring on site? Yes X (check type: shallow rock spring X) No
 How many public water supply wells are located within a 0.5 mile radius? 1 min. distance (ft): 300
 How many private water supply wells are located within a 0.5 mile radius? 1 min. distance (ft): 250 at least
 What receptors have been impacted? X soil indoor air X groundwater surface water water supply

Section D. Statements of UST closure compliance: (must have both signatures or site assessment not complete)
 As the party responsible for compliance with the Vermont UST Regulations and related statutes at this facility, I
 hereby certify that all of the information provided on this form is true and correct to the best of my knowledge.

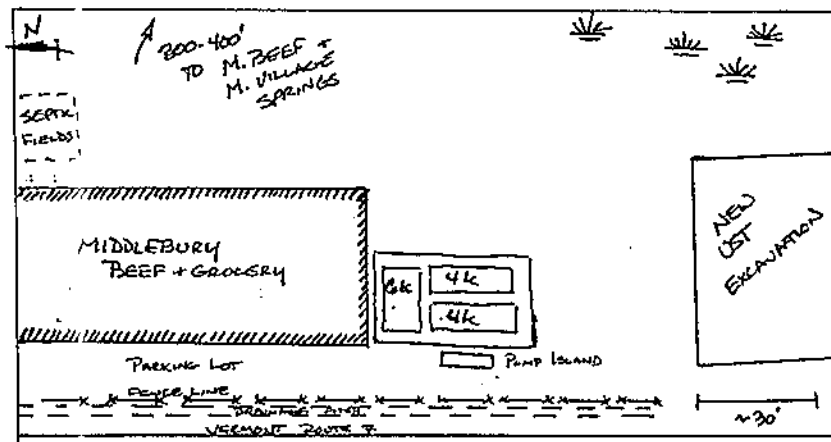
 Signature of UST owner or owner's authorized representative Date: _____

As the environmental consultant on site, I hereby certify that the site assessment requirements were performed in
 accordance with DEC policy and regulations, and that information which I have provided on this form is true and
 correct to the best of my knowledge.

Timothy A. O'Malley Date: JUNE 3, 1996
 Signature of Environmental Consultant

SITE DIAGRAM

Show location of all tanks and distance to permanent structures, sample points, areas of contamination, potential
 receptors and any pertinent site information. Indicate North arrow and major street names or route number.



Return form along with complete narrative report and photographs to the Department of Environmental Conservation,
 Underground Storage Tank Program within 72 hours of closure.

UNDERGROUND STORAGE TANK PERMANENT CLOSURE FORM

AGENCY USE ONLY
 Sched. closure date: 5-29-96
 Facility Town: MIDDLEBURY
 Facility ID#: 1373
 DEC Official: ST
 Evaluated by: _____

VERMONT AGENCY OF NATURAL RESOURCES
 DEPT. OF ENVIRONMENTAL CONSERVATION
 HAZARDOUS MATERIALS MANAGEMENT DIV.
 103 SOUTH MAIN STREET, WEST BUILDING
 WATERBURY, VERMONT 05671-0404
 TELEPHONE: (802) 241-3888

Company conducting
 site assessment: HARPER ASSOCIATES
 Person conducting
 site assessment: T.M. SCHMALZ
 Telephone number of
 company for person: (802) 229-1115
 Date of UST closure: 5/30/96
 Date of site assessment: _____

This Closure Form may only be used for the facility and date indicated in the upper left hand corner. Changes in the scheduled closure date should be phoned in at least 48 hours in advance. Both the yellow and white copies must be returned to the above address; the pink copy should be retained by the UST owner. A written report from an environmental consultant covering all aspects of closure and site assessment, complete with photographs and any other relevant data, must accompany this form. All procedures must be conducted by qualified personnel - including training required by 29 CFR 1910.120. Documentation of all methods and materials used must be adequate. All work must be performed in compliance with DEC policy "UST Closure and Site Assessment Requirements" as well as all applicable statutes, regulations, and additional policies. The DEC may reject inadequate closure forms and reports.

Section A. Facility Information:

Name of Facility: MIDDLEBURY BEEF + GROCERY Number of Employees: _____
 Street address of facility: _____
 Owner of UST(s) to be closed: _____
 Name of Contact and telephone number if different from owner: _____
 Mailing address of owner: _____
 Telephone number of owner: _____

Section B. UST Closure Information: (please check one)

Reason for initiating UST Closure: ☐ Suspected Leak ☐ Liability ☐ Replacement ☐ Abandoned
 Which portion of UST is being closed: ☐ Tanks ☐ Piping ☐ Tanks & Piping
 USTs undergoing permanent closure. Include condition and if leaks were found:

UST#	Product	Size (gallons)	Tank age	Tank condition	Piping age	Piping condition

Which tanks, if any, will be closed in-place (must have approval from DEC) _____
 Disposal/destruction of removed UST(s): _____
 Location _____ Date / / Method _____ Date / /

Amount (gal.) and type of waste generated from USTs: _____
 Tank cleaning company (must be trained in confined space entry): _____
 Certified hazardous waste hauler (tank contents are hazardous waste unless recovered and usable product): _____
 Hazardous waste generator ID number: _____

USTs not closed. This portion must be filled in to include all USTs, regardless of size, and status, *whether "abandoned", "in use", "to be installed", or "not aware of any other tanks on-site". Remember: most new installations require permits and advance notice to this office.

UST#	Product	Size (gallons)	Tank age	*Tank Status	Piping Age	*Piping Status

Section C. Initial site characterization:

Work in this section must be completed by a professional environmental consultant or hydrogeologist with experience in environmental sampling for the presence of hazardous materials. A full report from the consultant must accompany this form.

Excavation size (ft²): 960 Excavation depth (ft): 8-9 Soil type: GRAVELLY SILT SANDS Bedrock depth (ft): NA
 PID Information: Make: PHOTOVAL Model: 3020

Appendix B
Soil Boring/Monitoring Well Logs

SOIL BORING / MONITORING WELL CONSTRUCTION LOG

WELL BORING ID: MW-101

Client / Site:	S. B. Collins / Middlebury Beef and Grocery	Well Construction Information	
Location:	Middlebury Beef, East Middlebury, VT	Total Depth Drilled:	13.0' BGS
Project Number:	04-28	Screen Type/Interval:	2.0" PVC 0.020 inch id / 12.5' - 2.5' BGS
Driller:	N. Faulkner, Tri-State Drilling & Boring	Riser Type/Interval:	2.0" PVC / 2.5' - 0.5' BGS
Drilling Method:	4.25-inch HSA	Sandpack Type/Interval:	#1 sand / 12.5' - 2.0' BGS
Geologist:	T. Schmalz, Hoffer & Associates	Seal Type/Interval:	Bentonite chips / 2.0' - 1.0' BGS
Sampling Method:	2-inch split spoon	Water Level/Date-Time:	3.24' BTOC, 10/21/96, 1620
Date:	10/21/96	Elevation Ground:	98.14
Weather:	Cloudy, rainy, cool (45° F)	Elevation TOC:	97.72
Boring Location:	Unpaved parking area to east of building		

Sample Interval (feet BGS)	Blow Counts Recovery (feet)	Depth (feet)		Sample Description	USDA / SCS Soil Classification	PID Reading* (ppm)
		From	To			
0.0-2.0				Augered from 0.0 to 2.0 feet through silty sand fill	(fill)	na
2.0 - 4.0	1-2-1-2 (0.6)	2.0	2.6	Dark brown, humic, soft, sandy silt (topsoil) (15% fine angular sand, 80% brown silt, 5% clay).	silt loam to silt	0.1
5.0 - 7.0	3-3-8-9 (0.8)	5.0	5.8	Brown-gray, wet, soft, gravelly sand (30% fine angular to subangular gravel, 60% fine to coarse angular sand, 10% silt and clay).	gravelly sand	0.2
10.0 - 12.0	6-8-9-10 (0.8)	10.0	10.8	Same (as above).	gravelly sand	0.1

Generalized Geologic Log and Other Observations:

0.0 - 2.0' Loose, coarse, angular to subrounded gravel and silty sands (parking lot fill).
 2.0 - 3.0' Topsoil-brown, soft, frequent root and other plant material.
 3.0 -12.5' Lacustrine/alluvial sands and fine gravel/gravelly sand, wet to saturated.

Notes:

* = Peak Headspace Reading, Photovac MicroTIP HI-2000, calibrated to isobutylene.

BGS = Below Ground Surface, AGS = Above Ground Surface, NR = No Recovery, BTOC = Below Top Of Casing

SOIL BORING / MONITORING WELL CONSTRUCTION LOG

WELL BORING ID: MW-102

Client / Site:	S. B. Collins / Middlebury Beef and Grocery
Location:	Middlebury Beef, East Middlebury, VT
Project Number:	04-28
Driller:	N. Faulkner, Tri-State Drilling & Boring
Drilling Method:	4.25-inch HSA
Geologist:	T. Schmalz, Hoffer & Associates
Sampling Method:	2-inch split spoon
Date:	10/21/96
Weather:	Cloudy, rainy, cool (45° F)
Boring Location:	Paved area to west of main entrance

Well Construction Information	
Total Depth Drilled:	13.0' BGS
Screen Type/Interval:	2.0" PVC 0.020 inch id / 13.0' - 3.0' BGS
Riser Type/Interval:	2.0" PVC / 3.0' - 0.5' BGS
Sandpack Type/Interval:	#1 sand / 12.0' - 2.5' BGS
Seal Type/Interval:	Bentonite chips / 2.5' - 1.5' BGS
Water Level/Date-Time:	3.24' BTOC, 10/21/96, 1620
Elevation Ground:	98.28
Elevation TOC:	97.95

Sample Interval (feet BGS)	Blow Counts Recovery (feet)	Depth (feet)		Sample Description	USDA / SCS Soil Classification	PID Reading* (ppm)
		From	To			
5.0 - 7.0'	2-1-3-2 (NR)	5.0		(pushed stone) Material in spoon - Brown, moist, gravelly silty sand (25% angular to sub rounded fine gravel, 35% f to m sand, 40% silt and clay, soft, brown).	gravelly sandy clay loam	1027.0
10.0 - 12.0'	3-5-7-8 (NR)	10.0		(pushed stone) Material in spoon - Brown, moist sand (90% medium angular sand, 5% silt, 5% clay).	sand	7.5

Generalized Geologic Log and Other Observations:

0.0 - 1.5' Asphalt and underbed material-loose, angular sandy gravel fill.
 1.5 - 10.0' Lacustrine/alluvial gravelly silty sands, moist to wet (at 4' BGS).
 10.0 - 13.0' Lacustrine/alluvial sands.

Notes:

* = Peak Headspace Reading, Photovac MicroTIP HL-2000, calibrated to isobutylene.

BGS = Below Ground Surface, AGS = Above Ground Surface, NR = No Recovery, BTOC = Below Top Of Casing

SOIL BORING / MONITORING WELL CONSTRUCTION LOG

WELL BORING ID: MW-103

Client / Site:	S. B. Collins / Middlebury Beef and Grocery	Well Construction Information	
Location:	Middlebury Beef, East Middlebury, VT	Total Depth Drilled:	11.5' BGS
Project Number:	04-28	Screen Type/Interval:	2.0" PVC 0.020 inch id / 10.0' - 3.0' BGS
Driller:	N. Faulkner, Tri-State Drilling & Boring	Riser Type/Interval:	2.0" PVC / 3.0' - 0.5' BGS
Drilling Method:	4.25-inch HSA	Sandpack Type/Interval:	#1 sand / 11.5' - 2.5' BGS
Geologist:	T. Schmalz, Hoffer & Associates	Seal Type/Interval:	Bentonite chips / 2.5' - 1.5' BGS
Sampling Method:	2-inch split spoon	Water Level/Date-Time:	3.39' BTOC, 10/21/96, 1620
Date:	10/21/96	Elevation Ground:	97.84
Weather:	Cloudy, rainy, cool (45° F)	Elevation TOC:	96.92
Boring Location:	Paved area at south end of west fence		

Sample Interval (feet BGS)	Blow Counts Recovery (feet)	Depth (feet)		Sample Description	USDA / SCS Soil Classification	PID Reading* (ppm)
		From	To			
				Augered to 1.0 feet through pavement and silty gravel fill.		
1.0 - 3.0'	2-4-7-9 (0.8)	1.0	1.8	Red-brown gravelly fine sand (fill) (15% fine, angular gravel, 75% sand, 5% silt, 5% clay).	gravelly sand	0.0
5.0 - 7.0'	1-2-3-50/2 (0.6)	5.0	5.6	Dark brown, wet, fine sandy silt (40% fine sand, 50% silt, 10% clay).	silt loam	27.7
10.0 - 12.0'	2-5-6-8 (0.6)	10.0	10.6	Brown, wet, gravelly sand (60% well graded, loose sand, 40% f to m round to sub rounded gravel).	gravelly sand	0.0

Generalized Geologic Log and Other Observations:

- 0.0 - 1.0' Asphalt and underbed material-loose, angular silty gravel fill.
- 1.0 - 3.0' Angular gravel fill.
- 3.0 - 7.0' Alluvial silt layers in fine sand and gravels, saturated at 4.0' BGS.
- 7.0 - 10.0' Lacustrine/alluvial sands and gravels.

Notes:

* = Peak Headspace Reading, Photovac MicroTIP HL-2000, calibrated to isobutylene.

BGS = Below Ground Surface, AGS = Above Ground Surface, NR = No Recovery, BTOC = Below Top Of Casing

SOIL BORING / MONITORING WELL CONSTRUCTION LOG

WELL BORING ID: MW-104

Client / Site:	S. B. Collins / Middlebury Beef and Grocery	Well Construction Information	
Location:	Middlebury Beef, East Middlebury, VT	Total Depth Drilled:	13.0' BGS
Project Number:	04-28	Screen Type/Interval:	2.0" PVC 0.020 inch id /12.5' - 2.5' BGS
Driller:	N. Faulkner, Tri-State Drilling & Boring	Riser Type/Interval:	2.0" PVC /2.5' - 0.5' BGS
Drilling Method:	4.25-inch HSA	Sandpack Type/Interval:	#1 sand / 12.5' - 2.0' BGS
Geologist:	T. Schmalz, Hoffer & Associates	Seal Type/Interval:	Bentonite chips / 2.0' - 1.0' BGS
Sampling Method:	2-inch split spoon	Water Level/Date-Time:	3.64' BTOC, 10/21/96, 1620
Date:	10/21/96	Elevation Ground:	97.79
Weather:	Cloudy, rainy, cool (45° F)	Elevation TOC:	97.38
Boring Location:	Stony area east of sign		

Sample Interval (feet BGS)	Blow Counts Recovery (feet)	Depth (feet)		Sample Description	USDA / SCS Soil Classification	PID Reading* (ppm)
		From	To			
				Augered through brown silty sands and gravels to 5.0' BGS		
5.0 - 7.0'	2-2-1-4 (1.3)	5.0	6.3	Gray-brown, moist, sand (80% f to m angular sand, 15% silt, 5% clay).	loamy sand	0.1
10.0 - 12.0'	2-2-4-5 (NR)	10.0	12.0	Material in spoon is slop from augers Same (as above), trace fine gravel.	loamy sand	0.0

Generalized Geologic Log and Other Observations:

0.0 - 5.0' Angular gravel and silty sand fill.
5.0 - 12.0' Lacustrine/alluvial sands, saturated at 4' BGS.

Notes:

* = Peak Headspace Reading, Photovac MicroTIP HL-2000, calibrated to isobutylene.

BGS = Below Ground Surface, AGS = Above Ground Surface, NR = No Recovery, BTOC = Below Top Of Casing

SOIL PROBE LOG

Page 1 of 4
MW # 101
Middlebury, VT.

TRI STATE
DRILLING & BORING, INC.
RR2, Box 113, West Burke, VT 05871
(802) 467-3123

		SAMPLER	SOIL
		Continuous	Saturated
TYPE	HSA		Wet
SIZE	2"		Moist
HAMMER	140#		Damp
FALL	30"		Slightly Damp

DATE STARTED: 10/21/96

DATE COMPLETED: 10/21/96

FOOTAGE	DEPTH	BLOW	COUNTS	REC	DRILLER'S NOTES & COMMENTS
---------	-------	------	--------	-----	----------------------------

6 12 18 24

0-2'	2	2	2	3	14"
2-4'	3	3	3	3	14"
4-6'	3	3	8	9	14"
6-8'	6	7	8	9	14"
8-10'	6	7	8	9	14"
10-12'	6	7	8	9	14"
12-14'	6	7	8	9	14"
14-16'	6	7	8	9	14"
16-18'	6	7	8	9	14"
18-20'	6	7	8	9	14"
20-22'	6	7	8	9	14"
22-24'	6	7	8	9	14"
24-26'	6	7	8	9	14"
26-28'	6	7	8	9	14"
28-30'	6	7	8	9	14"
30-32'	6	7	8	9	14"
32-34'	6	7	8	9	14"
34-36'	6	7	8	9	14"
36-38'	6	7	8	9	14"
38-40'	6	7	8	9	14"
40-42'	6	7	8	9	14"
42-44'	6	7	8	9	14"
44-46'	6	7	8	9	14"
46-48'	6	7	8	9	14"
48-50'	6	7	8	9	14"
50-52'	6	7	8	9	14"
52-54'	6	7	8	9	14"
54-56'	6	7	8	9	14"
56-58'	6	7	8	9	14"
58-60'	6	7	8	9	14"
60-62'	6	7	8	9	14"
62-64'	6	7	8	9	14"
64-66'	6	7	8	9	14"
66-68'	6	7	8	9	14"
68-70'	6	7	8	9	14"
70-72'	6	7	8	9	14"
72-74'	6	7	8	9	14"
74-76'	6	7	8	9	14"
76-78'	6	7	8	9	14"
78-80'	6	7	8	9	14"
80-82'	6	7	8	9	14"
82-84'	6	7	8	9	14"
84-86'	6	7	8	9	14"
86-88'	6	7	8	9	14"
88-90'	6	7	8	9	14"
90-92'	6	7	8	9	14"
92-94'	6	7	8	9	14"
94-96'	6	7	8	9	14"
96-98'	6	7	8	9	14"
98-100'	6	7	8	9	14"

Coarse grave; Over 6" of top soil
and fine sand.
Medium and coarse sand and gravel.

Same as above.

Screen 12 1/2' to 2 1/2' Riser to surface.
#1 Sand 12 1/2' to 2' Chips 2' to 1'

Project: Middlebury Beef
Job Location: Middlebury, VT.
Engineer: Hoffer & Associates
Inspector: Tim Smaltz

Driller: Neal S. Faulkner
Helper: Alan B. Colburn
Materials: 10' (20 slot) screen,
3' riser, 1 cap, 1 locking plug,
4 bags of sand, 1 bag chips,
and 1 road box.

Page 2 of 4
MW # ~~102~~ 102
Middlebury, VT.

Page 2 of 4
MW # ~~102~~ 102
Middlebury, VT.

SOIL
Saturated
Wet
Moist
Damp
Slightly Damp

DATE COMPLETED: 10/21/96

DRILLER'S NOTES & COMMENTS

Coarse sand and gravel. Strong gas odor.

Medium sand and stones

Augered to 13'

20 Slot Screen 13' to 3' Riser to surface.

#1 Sand 13' to 2' 6" Chips to 1' 6"

Driller: Neal S. Faulkner
Helper: Alan B. Colburn
Materials: 10' (20 slot) screen,
3' riser, 1 cap, 1 locking plug,
4 bags of sand, 1/2 bag chips,
and 1 road box.

Page 3 of 4
MW# 109
Middlebury, VT.

Page 3 of 4
MW# 109
Middlebury, VT.

		SAMPLER	SOIL
		Continuous	Saturated
TYPE	HSA		Wet
SIZE	2"		Moist
HAMMER	140#		Damp
FALL	30"		Slightly Damp

DATE COMPLETED: 10/21/96

[illegible]

6 12 18 24

1-3'	3	4	6	5	
5-7'	1	2	3		
10-11.1/2	2	5	6		10"

Red brown medium and coarse sand
and gravel.
Olive gray fine sand. Gas odor.

Red brown fine to coarse sand
and gravel.

10 Slot Screen 10' to 3' Riser to surface.
#1 Sand 10' to 2' 6" Chips to 1'6"

Project: Middlebury Beef
Job Location: Middlebury, VT.
Engineer: Hoffer & Associates
Inspector: Tim Smaltz

Driller: Neal S. Faulkner
Helper: Alan B. Colburn
Materials: 10' (10 slot) screen,
3' riser, 1 cap, 1 locking plug,
3 bags of sand, 1/2 bag chips,
and 1 road box.

Page 4 of 4
MW # ~~104~~
Middlebury, VT.

Middlebury, VT.

		SAMPLER	SOIL
		Continuous	Saturated
TYPE	HSA		Wet
SIZE	2"		Moist
HAMMER	140#		Damp
FALL	30"		Slightly Damp

DATE STARTED: 10/21/96

DATE COMPLETED: 10/21/96

FOOTAGE
DEPTH BLOW COUNTS REC

DRILLER'S NOTES & COMMENTS

6 12 18 24

[illegible]

Red brown fine and medium sand.

olive gray fine to medium sand
and gravel.

Augered to 13'.

20 Slot Screen 12'6" to 2'6" Riser to
Surface, #1 Sand 12'6" to 2',
Chips 2' to 1'.

Project: Middlebury Beef
Job Location: Middlebury, VT.
Engineer: Hoffer & Associates
Inspector: Tim Smaltz

Driller: Neal S. Faulkner
Helper: Alan B. Colburn
Materials: 10' (20 slot) screen,
2' riser, 1 cap, 1 locking plug,
3 bags of sand, 1/2 bag chips,
and 1 road box.

Appendix C
Analytical Results



SCITEST
LABORATORY SERVICES

ANALYTICAL REPORT

P.O. Box 339
Randolph, Vermont 05060-0339
(802) 728-6313

SB Collins, Inc.
PO Box 671
54 Lower Welden Street
St. Albans, VT 05478
Carl Ruprecht

Work Order No.: 9611-03590

Project Name: Middlebury Beef
Customer Nos.: 090048

Date Received: 11/01/96
Date Reported: 11/07/96

Sample Desc.: MW-101				Sample Date: 10/31/96	
Sample Nos: 1				Collection Time: 13:50	
Test Performed	Method	Results	Units	Analyst	Analysis Date
Aromatic Volatile Organics	EPA 8020			JPM	11/05/96
Methyl Tertiary Butyl Ether	EPA 8020	BPQL	ug/L	JPM	11/05/96
Benzene	EPA 8020	BPQL	ug/L	JPM	11/05/96
Toluene	EPA 8020	BPQL	ug/L	JPM	11/05/96
Ethyl Benzene	EPA 8020	BPQL	ug/L	JPM	11/05/96
Total Xylenes	EPA 8020	BPQL	ug/L	JPM	11/05/96
Chlorobenzene	EPA 8020	BPQL	ug/L	JPM	11/05/96
1,2-Dichlorobenzene	EPA 8020	BPQL	ug/L	JPM	11/05/96
1,3-Dichlorobenzene	EPA 8020	BPQL	ug/L	JPM	11/05/96
1,4-Dichlorobenzene	EPA 8020	BPQL	ug/L	JPM	11/05/96
Surrogate: 8020				JPM	11/05/96
***Bromofluorobenzene-8020		95	% Recovery	JPM	11/05/96

Sample Desc.: MW-104				Sample Date: 10/31/96	
Sample Nos: 2				Collection Time: 14:10	
Test Performed	Method	Results	Units	Analyst	Analysis Date
Aromatic Volatile Organics	EPA 8020			JPM	11/05/96
Methyl Tertiary Butyl Ether	EPA 8020	BPQL	ug/L	JPM	11/05/96
Benzene	EPA 8020	BPQL	ug/L	JPM	11/05/96
Toluene	EPA 8020	BPQL	ug/L	JPM	11/05/96
Ethyl Benzene	EPA 8020	BPQL	ug/L	JPM	11/05/96
Total Xylenes	EPA 8020	BPQL	ug/L	JPM	11/05/96
Chlorobenzene	EPA 8020	BPQL	ug/L	JPM	11/05/96
1,2-Dichlorobenzene	EPA 8020	BPQL	ug/L	JPM	11/05/96
1,3-Dichlorobenzene	EPA 8020	BPQL	ug/L	JPM	11/05/96
1,4-Dichlorobenzene	EPA 8020	BPQL	ug/L	JPM	11/05/96
Surrogate: 8020				JPM	11/05/96
***Bromofluorobenzene-8020		96	% Recovery	JPM	11/05/96

ANALYTICAL REPORT

Project Name: Middlebury Beef
Project No.: 090048

Work Order No.: 9611-03590

Sample Desc.: MW-103				Sample Date: 10/31/96	
Sample Nos: 3				Collection Time: 14:25	
Test Performed	Method	Results	Units	Analyst	Analysis Date
Aromatic Volatile Organics	EPA 8020			JPM	11/05/96
Methyl Tertiary Butyl Ether	EPA 8020	9	ug/L	JPM	11/05/96
Benzene	EPA 8020	< 5	ug/L	JPM	11/05/96
Toluene	EPA 8020	27	ug/L	JPM	11/05/96
Ethyl Benzene	EPA 8020	41	ug/L	JPM	11/05/96
Total Xylenes	EPA 8020	9	ug/L	JPM	11/05/96
Chlorobenzene	EPA 8020	BPQL	ug/L	JPM	11/05/96
1,2-Dichlorobenzene	EPA 8020	BPQL	ug/L	JPM	11/05/96
1,3-Dichlorobenzene	EPA 8020	BPQL	ug/L	JPM	11/05/96
1,4-Dichlorobenzene	EPA 8020	BPQL	ug/L	JPM	11/05/96
Surrogate: 8020				JPM	11/05/96
***Bromofluorobenzene-8020		208	% Recovery	JPM	11/05/96

Sample Desc.: MW-01				Sample Date: 10/31/96	
Sample Nos: 4				Collection Time: 14:40	
Test Performed	Method	Results	Units	Analyst	Analysis Date
Aromatic Volatile Organics	EPA 8020			JPM	11/05/96
Methyl Tertiary Butyl Ether	EPA 8020	18800	ug/L	JPM	11/05/96
Benzene	EPA 8020	13700	ug/L	JPM	11/05/96
Toluene	EPA 8020	23700	ug/L	JPM	11/05/96
Ethyl Benzene	EPA 8020	2080	ug/L	JPM	11/05/96
Total Xylenes	EPA 8020	17400	ug/L	JPM	11/05/96
Chlorobenzene	EPA 8020	< 200	ug/L	JPM	11/05/96
1,2-Dichlorobenzene	EPA 8020	< 200	ug/L	JPM	11/05/96
1,3-Dichlorobenzene	EPA 8020	< 200	ug/L	JPM	11/05/96
1,4-Dichlorobenzene	EPA 8020	< 200	ug/L	JPM	11/05/96
Surrogate: 8020				JPM	11/05/96
***Bromofluorobenzene-8020		101	% Recovery	JPM	11/05/96

Sample Desc.: MW-102				Sample Date: 10/31/96	
Sample Nos: 5				Collection Time: 14:50	
Test Performed	Method	Results	Units	Analyst	Analysis Date
Aromatic Volatile Organics	EPA 8020			JPM	11/05/96
Methyl Tertiary Butyl Ether	EPA 8020	494	ug/L	JPM	11/05/96
Benzene	EPA 8020	1540	ug/L	JPM	11/05/96



ANALYTICAL REPORT

Project Name: Middlebury Beef
Project No.: 090048

Work Order No.: 9611-03590

Sample Desc.: MW-102				Sample Date: 10/31/96	
Sample Nos: 5				Collection Time: 14:50	
Test Performed	Method	Results	Units	Analyst	Analysis Date
Toluene	EPA 8020	9320	ug/L	JPM	11/05/96
Ethyl Benzene	EPA 8020	1400	ug/L	JPM	11/05/96
Total Xylenes	EPA 8020	9200	ug/L	JPM	11/05/96
Chlorobenzene	EPA 8020	< 200	ug/L	JPM	11/05/96
1,2-Dichlorobenzene	EPA 8020	< 200	ug/L	JPM	11/05/96
1,3-Dichlorobenzene	EPA 8020	< 200	ug/L	JPM	11/05/96
1,4-Dichlorobenzene	EPA 8020	< 200	ug/L	JPM	11/05/96
Surrogate: 8020				JPM	11/05/96
***Bromofluorobenzene-8020		104	% Recovery	JPM	11/05/96

Sample Desc.: MW-D				Sample Date: 10/31/96	
Sample Nos: 6				Collection Time: 15:10	
Test Performed	Method	Results	Units	Analyst	Analysis Date
Aromatic Volatile Organics	EPA 8020			JPM	11/05/96
Methyl Tertiary Butyl Ether	EPA 8020	< 20	ug/L	JPM	11/05/96
Benzene	EPA 8020	< 20	ug/L	JPM	11/05/96
Toluene	EPA 8020	34	ug/L	JPM	11/05/96
Ethyl Benzene	EPA 8020	34	ug/L	JPM	11/05/96
Total Xylenes	EPA 8020	< 20	ug/L	JPM	11/05/96
Chlorobenzene	EPA 8020	< 20	ug/L	JPM	11/05/96
1,2-Dichlorobenzene	EPA 8020	< 20	ug/L	JPM	11/05/96
1,3-Dichlorobenzene	EPA 8020	< 20	ug/L	JPM	11/05/96
1,4-Dichlorobenzene	EPA 8020	< 20	ug/L	JPM	11/05/96
Surrogate: 8020				JPM	11/05/96
***Bromofluorobenzene-8020		104	% Recovery	JPM	11/05/96

Sample Desc.: Spring-1				Sample Date: 10/31/96	
Sample Nos: 7				Collection Time: 15:30	
Test Performed	Method	Results	Units	Analyst	Analysis Date
Aromatic Volatile Organics	EPA 8020			JPM	11/05/96
Methyl Tertiary Butyl Ether	EPA 8020	BPQL	ug/L	JPM	11/05/96
Benzene	EPA 8020	BPQL	ug/L	JPM	11/05/96
Toluene	EPA 8020	BPQL	ug/L	JPM	11/05/96
Ethyl Benzene	EPA 8020	BPQL	ug/L	JPM	11/05/96
Total Xylenes	EPA 8020	BPQL	ug/L	JPM	11/05/96

ANALYTICAL REPORT

Project Name: Middlebury Beef
Project No.: 090048

Work Order No.: 9611-03590

Sample Desc.: Spring-1	Sample Date: 10/31/96
Sample Nos: 7	Collection Time: 15:30
Test Performed	Method Results Units Analyst Analysis Date
Chlorobenzene	EPA 8020 BPQL ug/L JPM 11/05/96
1,2-Dichlorobenzene	EPA 8020 BPQL ug/L JPM 11/05/96
1,3-Dichlorobenzene	EPA 8020 BPQL ug/L JPM 11/05/96
1,4-Dichlorobenzene	EPA 8020 BPQL ug/L JPM 11/05/96
Surrogate: 8020	JPM 11/05/96
***Bromofluorobenzene-8020	98 % Recovery JPM 11/05/96

Sample Desc.: FB-01	Sample Date: 10/31/96
Sample Nos: 8	Collection Time: 15:20
Test Performed	Method Results Units Analyst Analysis Date
Aromatic Volatile Organics	EPA 8020 JPM 11/05/96
Methyl Tertiary Butyl Ether	EPA 8020 BPQL ug/L JPM 11/05/96
Benzene	EPA 8020 BPQL ug/L JPM 11/05/96
Toluene	EPA 8020 BPQL ug/L JPM 11/05/96
Ethyl Benzene	EPA 8020 BPQL ug/L JPM 11/05/96
Total Xylenes	EPA 8020 BPQL ug/L JPM 11/05/96
Chlorobenzene	EPA 8020 BPQL ug/L JPM 11/05/96
1,2-Dichlorobenzene	EPA 8020 BPQL ug/L JPM 11/05/96
1,3-Dichlorobenzene	EPA 8020 BPQL ug/L JPM 11/05/96
1,4-Dichlorobenzene	EPA 8020 BPQL ug/L JPM 11/05/96
Surrogate: 8020	JPM 11/05/96
***Bromofluorobenzene-8020	96 % Recovery JPM 11/05/96

Sample Desc.: Trip Blank	Sample Date: 10/31/96
Sample Nos: 9	Collection Time: 12:00
Test Performed	Method Results Units Analyst Analysis Date
Aromatic Volatile Organics	EPA 8020 JPM 11/05/96
Methyl Tertiary Butyl Ether	EPA 8020 BPQL ug/L JPM 11/05/96
Benzene	EPA 8020 BPQL ug/L JPM 11/05/96
Toluene	EPA 8020 BPQL ug/L JPM 11/05/96
Ethyl Benzene	EPA 8020 BPQL ug/L JPM 11/05/96
Total Xylenes	EPA 8020 BPQL ug/L JPM 11/05/96
Chlorobenzene	EPA 8020 BPQL ug/L JPM 11/05/96
1,2-Dichlorobenzene	EPA 8020 BPQL ug/L JPM 11/05/96
1,3-Dichlorobenzene	EPA 8020 BPQL ug/L JPM 11/05/96

ANALYTICAL REPORT

Project Name: Middlebury Beef
Project No.: 090048

Work Order No.: 9611-03590

Sample Desc.: Trip Blank				Sample Date:	10/31/96
Sample Nos: 9				Collection Time:	12:00
Test Performed	Method	Results	Units	Analyst	Analysis Date
1,4-Dichlorobenzene	EPA 8020	BPQL	ug/L	JPM	11/05/96
Surrogate: 8020				JPM	11/05/96
***Bromofluorobenzene-8020		97	% Recovery	JPM	11/05/96

BPQL = Below Practical Quantitation Limit; 1 ug/L

NOTE: MW-D and MW-103 contained many miscellaneous peaks, including some which coeluted with the surrogate.

c: Hoffer & Associates

Authorized by: Joann Skhod

bill: SB Collins, Inc.
54 Lower Welden St
St. Albans, VT, 05478
cc results: Hoffer & Assoc.

Middlebury Brief

Scitest, Inc.

P.O. Box 339

Route 66 Professional Center, Randolph, VT 05600

Phone: (802)728-3313 Fax: (802)728-6044

Client: Jefferson P. Hoffer & Associates

Address RR 4 Box 2286, Cornstock Road
Montpelier, VT 05602

Sample Logged in By: WJB

Anomaly Sheet: Y N

Preservative Check:

Temperature Check:

Contact Jeff Hoffer

Customer Nos:

70249

Date requested:

10/30/96

Project:

Date picked up:

10/30/96

Job Template:

Date scheduled:

Phone Nos

CHAIN OF CUSTODY

Sampled by:	Date	Time	Print Name Here:	Date	Time
<u>Timothy F. Schmalz</u>	<u>10/31/96</u>		<u>TIMOTHY F. SCHMALZ</u>		
Relinquished by:	Date	Time	Accepted by:	Date	Time
<u>Jeff Hoffer</u>	<u>10/31/96</u>		<u>Timothy F. Schmalz</u>	<u>11/1/96</u>	<u>8:00</u>
Relinquished by:	Date	Time	Received by Scitest:	Date	Time
			<u>Timothy F. Schmalz</u>		

Item Nos	Client ID or Description	Sample Date	Sample Time	Matrix	Preservative	Container Material	Container Volume	Containers per Sample	Parameters
1	MW-101	<u>10/31/96</u>	<u>1350</u>	GW	HCl	Glass	40 mL	2	EPA 8020
2	MW-104		<u>1410</u>	GW	HCl	Glass	40 mL	2	EPA 8020
3	MW-103		<u>1425</u>	GW	HCl	Glass	40 mL	2	EPA 8020
4	MW-01		<u>1440</u>	GW	HCl	Glass	40 mL	2	EPA 8020
5	MW-102		<u>1450</u>	GW	HCl	Glass	40 mL	2	EPA 8020
6	MW-D		<u>1510</u>	GW	HCl	Glass	40 mL	2	EPA 8020
7	SPRING-1		<u>1530</u>	GW	HCl	Glass	40 mL	2	EPA 8020
8	MW-D		<u>1510</u>	GW	HCl	Glass	40 mL	2	EPA 8020
8	FB-01		<u>1520</u>	GW	HCl	Glass	40 mL	2	EPA 8020
9	Trip Blank		<u>1560</u>	WA	HCl	Glass	40 mL	2	EPA 8020

Date	11/1/96	Time	8:00
Post-it Fax Note	7671	Co/Dept	Tim Schmalz
		Phone #	Hoffer & Assoc.
		Fax #	229-2780

SAMPLES MUST REACH THE LAB

within

of sampling time to meet all holding times.

Parameters are correct as listed

Client Initial:

Please fill in ALL areas marked with an asterisk (*). Thank you.

(Additional instruction if applicable are attached.)

Scitest Work Order:

9610-03590

Page _ of _

GROUNDWATER SAMPLING DATA SHEET

LOCATION: MIDDLEBURY BEEF & GROCERY
DATE: OCT. 31, 1996

SAMPLE METHOD: 2" POLY BAILERS
SAMPLING TEAM: T. SCHMALZ

Page 4 of 4

[illegible]

* (1.5" = 0.092 gals/ft, 2" = 0.16 gals/ft, 4" = 0.65 gals/ft, 6" = 1.5 gals/ft)

REMARKS

Appendix D
Water Supply Well Logs



15C1

State of Vermont
DEPARTMENT OF WATER RESOURCES

Form WR-59

WELL COMPLETION REPORT

(This report must be completed and submitted to the Department of Water Resources, State Office Building, Montpelier, Vermont 05602, no later than 30 days after completion of well.)

Do not fill in

State Well No. *N-48-58-174*
Other No. *W-72-06-564*

WELL OWNER *Gateway Restaurant East Middlebury VT*
Name Mailing Address

WELL DRILLER *Howard Carden* *Hancock, VT*
Name Mailing Address

PROPOSED USE OR USES (Check):

- ☐ Domestic ☐ Agricultural ☒ Business Establishment ☐ Municipal ☐ Industrial
☐ Other (Specify use)

CASTING DETAILS (Inside)	YIELD TEST		WATER LEVEL (From land surface) (if possible)	SCREEN DETAILS
Length: <i>110</i> Feet	<input type="checkbox"/> Bailed or <input type="checkbox"/> Pumped or <input checked="" type="checkbox"/> Compressed Air	Hours	Static: <i>Flowing</i> Feet	Make:
Diameter: <i>6</i> Inches		<i>5</i> GPM	During Yield Test: Feet	Material:
Kind: <i>Steel</i>		DRILLING EQUIPMENT		Slot Size
Weight: <i>17</i> lbs/p/ft		<input type="checkbox"/> Cable Tool <input type="checkbox"/> Rotary <input checked="" type="checkbox"/> Air Percussion <input type="checkbox"/> Other (specify)		Length: Ft.
<input checked="" type="checkbox"/> New <input type="checkbox"/> Used	Yield: <i>5</i> GPM			Diameter: in.

TOTAL DEPTH OF WELL *110* FEET TOWN WELL IS LOCATED IN:
(Make sketch of well location on reverse side of sheet)

WELL LOG

East Middlebury

Depth From Ground Surface	Give description of formations penetrated, such as: peat, silt, sand, gravel, clay, hardpan, shale, limestone, granite, etc. Include size of gravel (diameter) and sand (fine, medium, coarse) color of material, structure (loose, packed, cemented, hard). For example: 0 ft. to 27 ft. fine, packed, yellow sand; 27 ft. to 134 ft. gray granite.
<i>0</i> ft. to <i>15</i> ft.	<i>Loose gravel</i>
<i>15</i> ft. to <i>105</i> ft.	<i>Hardpan</i>
<i>105</i> ft. to <i>110</i> ft.	<i>Hard Pack Gravel</i>
ft. to ft.	
ft. to ft.	

YIELD TEST DATA IN G.P.M.

If yield was tested at different depth during drilling,
List Below

ft.	G.P.M.
ft.	G.P.M.
ft.	G.P.M.

Has sample of well water been analyzed? *NO*

Where was sample analyzed?
(Include analysis of sample if analyzed by other than Department of Water Resources.)

Date Well was Completed *10/31/66*

Date of Report

Water Well Driller's License No. *7*

Well Driller

Howard Carden
(signature)

WELL NO. / TAG NO.

14/89
(If for Driller's Use)

This report must be completed and submitted to the Department of Environmental Conservation, 103 South Main Street (10th), Waterbury, VT 05676 no later than 60 days after completion of the well.

State of Vermont
Dept. of Environmental Conservation
103 South Main Street (10th)
Waterbury, Vt. 05676

WELL COMPLETION REPORT

JAN 22 1990

Location map attached to WCR

DEPARTMENT USE ONLY

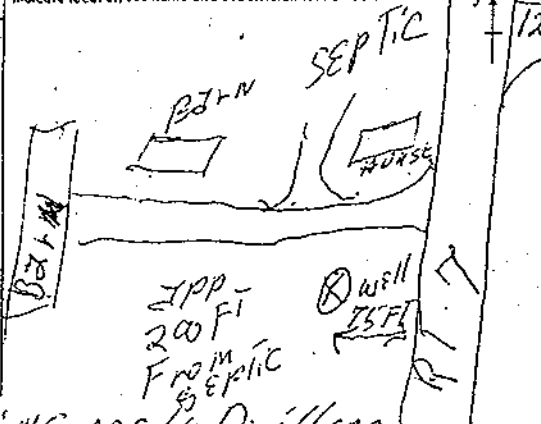
E.C. 194 U.S.G.S.
Field Location ☐ Map area 1561
Latitude " " " Elev. " "
Longitude " " " Topo. " "
Scale: 62,500 ☐ 25,000 ☐ 24,000 ☐
Data in Town Files ☐

1. WELL OWNER MARJORIE SESSIONS Middlebury VT
Name Permanent Mailing Address
OR
WELL PURCHASER SAME
Name Permanent Mailing Address
2. LOCATION OF WELL: TOWN Middlebury SUBDIVISION _____ LOT NO. _____
3. DATE WELL WAS COMPLETED 12/14/89
4. PROPOSED USE OF WELL: ☒ Domestic, ☐ Other _____
5. REASON FOR DRILLING WELL: ☐ New Supply, ☒ Replace Existing Supply, ☐ Deepen Existing Well, ☐ Test or Exploration,
☐ Provide Additional Supply, ☐ Other _____
6. DRILLING EQUIPMENT: ☒ Cable Tool, ☐ Rotary with A-P, ☐ Other _____
7. TYPE OF WELL: ☐ Open Hole in Bedrock, ☒ Open End Casing, ☐ Screened or Slotted; ☐ Other _____
8. TOTAL DEPTH OF WELL: 116 feet below land surface.
9. CASING FINISH: ☒ Above ground, Finished, ☐ Above ground, Unfinished, ☐ Buried, ☐ In Pit, ☐ Removed, ☐ None used, ☐ Other _____
10. CASING DETAILS: Total length 118 ft. Length below L.S. 116 ft. Dia. 6 5/8 in. Material STEEL Wt. 17 lb./ft.
11. LINER OR INNER CASING DETAILS: Length used _____ ft. Diameter _____ in. Material _____ Weight _____ lb./ft.
12. METHOD OF SEALING CASING TO BEDROCK: ☐ Drive Shoe, ☐ Grout - type _____, Drilled _____ in. hole _____ ft. in Bedrock
☐ Other OPEN PIPE IN GRAVEL
13. SCREEN DETAILS: Make and Type _____, Material _____, Length _____ ft., Diameter _____ in.,
Slot Size _____, Depth to top of screen in feet below land surface _____ ft., Gravel pack if used: Gravel Size or Type _____
14. YIELD TEST: ☒ Boiled, ☐ Pumped, ☐ Compressed Air, for 3 Hours at 5 Gallons per minute
Measured by ☒ Bucket, ☐ Orifice pipe, ☐ Wier, ☐ Meter ☐ Permanent Airline installed
15. STATIC WATER LEVEL: _____ feet below land surface, Date or Time measured _____, Overflows at 12 G.P.M.
16. WATER ANALYSIS: Has the water been analyzed? ☐ Yes ☒ No, If Yes, Where _____
17. SPECIAL NOTES: _____
18. WELL LOG

Depth from Land Surface		Water	Formation Description	Sketch
Feet	Feet			
Ground Surface	116		CLAYS MALLSTONE + QUICK SAND	

19. SITE MAP

Show permanent structure such as buildings, septic tanks, and/or other land marks and indicate not less than two distances to the well. Indicate local street name and subdivision lot number.



20. TESTED YIELD

If the yield was tested at different depths during drilling, list below:

Feet	Gallons Per Minute
116	5

WELL DRILLED BY: HAWKINS WELL DRILLING

DOING BUSINESS AS: _____

REPORT FILED BY: CAROL ANN P. HAWKINSDATE OF REPORT: 1/20/90

Company or Business Name

Authorized Signature

WELL DRILLERS LIC. NO. 200

15C1
State of Vermont
DEPARTMENT OF WATER RESOURCES

Form WR-59

WELL COMPLETION REPORT

AUG 15 1979

(This report must be completed and submitted to the Department of Water Resources, State Office Building, Montpelier, Vermont 05602, no later than 60 days after completion of well.)

Do not fill in

83

WELL OWNER E. MIDDLEBURY FIRE DIST. MIDDLEBURY, VT.
Name Mailing Address

WELL DRILLER F.G. SULLIVAN DRILLING CO INC. LANCASTER, MASS 01523
Name Mailing Address

PROPOSED USE OR USES (Check):

☐ Domestic ☐ Agricultural ☐ Business Establishment ☒ Municipal ☐ Industrial
☐ Other (Specify use)

CASTING DETAILS (Inside)		YIELD TEST		WATER LEVEL (From land surface) (if possible)		SCREEN DETAILS	
Length: <u>94'</u> Feet	<input type="checkbox"/> Bailed or <input checked="" type="checkbox"/> Pumped or <input type="checkbox"/> Compressed Air	<u>72</u> Hours	<u>400</u> GPM	Static: <u>+8.20'</u> Feet	Make: <u>JOHNSON</u>	Material: <u>304 STAINLESS STEEL</u>	Length: <u>12.0</u> Ft.
Diameter: <u>12"</u> Inches				During Yield Test: <u>47.0'</u> Feet			
Kind: <u>U.S. STEEL</u>							
Weight: <u> </u> lbs/p/ft				DRILLING EQUIPMENT			
<input checked="" type="checkbox"/> New <input type="checkbox"/> Used				<input checked="" type="checkbox"/> Cable Tool			
				<input type="checkbox"/> Rotary			
				<input type="checkbox"/> Air Percussion			
				<input type="checkbox"/> Other (specify)			
					Diameter: <u>12"</u> in. <u>TELESCOPE SIZE</u>		

TOTAL DEPTH OF WELL 106.20 FEET TOWN WELL IS LOCATED IN: E. MIDDLEBURY
(Make sketch of well location on reverse side of sheet)

WELL LOG

Depth From Ground Surface	Give description of formations penetrated, such as: peat, silt, sand, gravel, clay, hardpan, shale, limestone, granite, etc. Include size of gravel (diameter) and sand (fine, medium, coarse) color of material, structure (loose, packed, cemented, hard). For example: 0 ft. to 27 ft. fine, packed, yellow sand; 27 ft. to 134 ft. gray granite.		
<u>0' ft. to 11' ft.</u>	<u>BROWN GRAVEL</u>	<u>87'-95'</u>	<u>BROWN MED GRAVEL</u>
<u>11' ft. to 45' ft.</u>	<u>GRY/MARINE CLAY</u>	<u>95'-104'</u>	<u>BROWN COARSE GRAVEL</u>
<u>45' ft. to 56' ft.</u>	<u>GRY/SOFT CLAY</u>	<u>104'</u>	<u>REFUSAL</u>
<u>56' ft. to 71' ft.</u>	<u>BROWN FINE SAND</u>		
<u>71' ft. to 87' ft.</u>	<u>GRY/MARINE CLAY</u>		

YIELD TEST DATA IN G.P.M.

If yield was tested at different depth during drilling,
List Below

ft.	G.P.M.
ft.	G.P.M.
ft.	G.P.M.

Has sample of well water been analyzed? YES.

Where was sample analyzed? BURLINGTON, VT.
(Include analysis of sample if analyzed by other than Department of Water Resources.)

Date Well was Completed 7 MAY 79

Date of Report 1 AUG. 79

Water Well Driller's License No. 100

Well Driller

(signature)
Frances G. Sullivan Pres.

15C1

State of Vermont
DEPARTMENT OF WATER RESOURCES

Form WR-59

WELL COMPLETION REPORT

(This report must be completed and submitted to the Department of Water Resources, State Office Building, Montpelier, Vermont 05602, no later than 30 days after completion of well.)

Do not fill in
State Well No. *N-43° 58' 32"*
Other No. *N-73° 04' 52"*

WELL OWNER *Town of Middlebury* *Middlebury Vt.*
Name Mailing Address

WELL DRILLER *Layne-New England Company*
15 Ryder St., Arlington, Mass. 02174
Name Mailing Address

PROPOSED USE OR USES (Check):

☐ Domestic ☐ Agricultural ☐ Business Establishment ☐ Municipal ☐ Industrial
☒ Other (Specify use) *Test*

CASTING DETAILS (Inside)	YIELD TEST	WATER LEVEL (From land surface) (if possible)	SCREEN DETAILS
Length: <i>95</i> Feet	<input type="checkbox"/> Bailed or <input checked="" type="checkbox"/> Pumped or <input type="checkbox"/> Compressed Air	Static: <i>+ 6' 7"</i> G.L. Feet During Yield Test: <i>- 6"</i> G.L. Feet	Make: <i>Cook</i>
Diameter: <i>2 1/2</i> Inches	<i>43</i> Hours <i>92</i> GPM	DRILLING EQUIPMENT	Material: <i>Steel</i>
Kind: <i>Drive-</i>		<input type="checkbox"/> Cable Tool <input type="checkbox"/> Rotary <input type="checkbox"/> Air Percussion <input checked="" type="checkbox"/> Other (specify) <i>W.R.</i>	Slot Size Length: <i>10</i> Ft.
Weight: <i>10</i> lbs/p/ft			Diameter: <i>1 1/4"</i> in.
<input checked="" type="checkbox"/> New <input type="checkbox"/> Used	Yield: <i>92</i> GPM		

TOTAL DEPTH OF WELL *106* FEET TOWN WELL IS LOCATED IN: *Middlebury*
(Make sketch of well location on reverse side of sheet)

WELL LOG

Depth From Ground Surface	Give description of formations penetrated, such as: peat, silt, sand, gravel, clay, hardpan, shale, limestone, granite, etc. Include size of gravel (diameter) and sand (fine, medium, coarse) color of material, structure (loose, packed, cemented, hard). For example: 0 ft. to 27 ft. fine, packed, yellow sand; 27 ft. to 134 ft. gray granite.
<i>0</i> ft. to <i>16</i> ft.	<i>Medium Sand</i>
<i>16</i> ft. to <i>60</i> ft.	<i>Clay with Sand Shivers.</i>
<i>60</i> ft. to <i>87</i> ft.	<i>Fine Sand Clay & Silt.</i>
<i>87</i> ft. to <i>106</i> ft.	<i>Medium-Coarse Sand.</i>
<i>106</i> ft. to	<i>Refused (Ledge?)</i>

YIELD TEST DATA IN G.P.M.

If yield was tested at different depth during drilling,
List Below

ft.	G.P.M.
ft.	G.P.M.
ft.	G.P.M.

Has sample of well water been analyzed? *Yes*

Where was sample analyzed? *State*
(Include analysis of sample if analyzed by other than Department of Water Resources.)

Date Well was Completed *Nov 1, 1966*Date of Report *Dec 21, 1966*Water Well Driller's License No. *32*Well Driller *[Signature]*

Several other borings were drilled in the area with similar log except formation did not show in others - Formation is narrow channel Alluv.